ANALYSIS OF INTRAMURAL SPORTS INJURY RATES AT OKLAHOMA STATE UNIVERSITY

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CHAPTER I

Introduction

The problem being investigated is injury rates of participants in intramural activities at Oklahoma State University. Discovering what is causing injuries in the program is important as a first step to preventing injuries in the future. Baletka and Smith (1981) reported that a large number of injuries were occurring in their intramural flag football leagues at the University of Missouri. They stated that an assumption could be made that rules governing intramural football had an influence upon the number of injuries that occurred during play. As a result of their study, they enacted several rule changes for the upcoming season that included: 1) no three or four point stance allowed; 2) a fumbled ball was considered dead; 3) all punts were announced with no rushing allowed; and 4) a minimum of three offensive players were required on the line of scrimmage. Before the study during the 1979-80 school year, they recorded 76 injuries compared to 48 during the 1980-81 school year. This represented a 23% decrease in injuries in their flag football program in just one year.

Also, many injuries can be prevented through properly run risk management plans. In their study, Hall and Pitman (1993) stated that the development of a risk management program should help minimize the number of accidents and standardize the handling of accidents in any recreational sports facility. One way to standardize risk management, they reported, is to

develop a risk management manual that addresses at least the following three categories: 1) facilities and equipment; 2) supervision and training; and 3) policies and procedures.

Kaiser (1986) stated that the exposure identification phase of risk management is crucial since it is not possible to treat the risks faced by the agency and its personnel prior to loss without this identification. Kaiser went on to state that after the risk exposure has been identified, the agency must decide on the options available to protect against losses that include: 1) risk avoidance; 2) risk reduction; 3) risk retention; and 4) risk transference.

Peterson and Hronek (1992) reported the benefits of a risk management plan in their book. The benefits included serving as a safeguard to not being sued, evidence of intent to act responsibly when sued, increased safety for the consumers of services, reduced losses to the organization. In addition, they also noted the following: more effective use of available funds; identification of exposures covered through an alternative to insurance; increased attractiveness of the organization to insurance companies; reduced uncertainties associated with future projects; and easier monitoring of claims, losses, and insurance coverage.

At the same time, students need to be aware of the inherent risks involved in playing intramurals. van der Smissen (1990) stated that risks that are inherent must be activities that are a normal, integral part of the sport, not extraneous to it. Also, risk does not mean danger caused by negligence of the defendant. Hall and Pitman (1993) reported that as participation increases and facilities expand the likelihood of injury occurrence increases. Steps for decreasing injury rates in the future can include the following: rule modifications; skill level requirements; stricter rule enforcement; cancellation of

dangerous events; better facilities and equipment; and decreased competitiveness.

In the fall of 1995, inquires about the safety of intramural sports activities arose. This study came about because of this increased opinion that the injury rate of intramurals at Oklahoma State University was too high.

Operhall (1995) reported, in an article in the college daily newspaper, concerns that the treatment of injured participants in intramural activities at OSU were less that satisfactory. She quoted a participant that felt she received poor medical treatment by the on-field supervisor. It should be noted that, at the time of the accident, there were two participants injured at the same time on the same field. The supervisor, who was a certified EMT, attending the injuries felt that the other injury was more severe and needed prompt attention.

In an editorial by the Editorial Board (1995) in the same issue of the paper, concerns were expressed that intramural sports could be made safer. Suggestions for the program included staffing someone trained in first aid to handle emergencies, staffing off-duty doctors or nurses at all intramural activities, and providing intramural staff with a way to notify emergency personnel such as a two-way radio or phone. In addition to the editorial, an editorial cartoon accompanied the article that depicted a scoreboard keeping score as to when the last disfiguring accident had taken place on the intramural fields.

James (1995) responded to these articles by defending the intramural department. For every suggestion the Editorial Board proposed, he countered with facts noting that all supervisors are trained by the American Red Cross in Standard First Aid and CPR and are equipped with a first aid kit and emergency procedures, staffing off-duty nurses and doctors at all intramural events would

be unfeasible, and supervisors have access to phones for all intramural events.

Kurtz (1995), a columnist for the paper addressed these concerns two weeks later. In the column, he addressed the fact that all participants take the risk of getting hurt when playing intramural sports. He also said that the intramural department had defended itself with statistics and credentials. And finally, he felt that although injuries are a part of playing sports, intramurals are a way for students to be involved in a competitive atmosphere and are a way for them to blow off steam.

During this same time period, Salim (1995) reported that the Student Health Center would begin offering a Sports Medicine Clinic for one hour a day four times a week. Physicians and physical therapists would be available for students injured while playing sports. Although coincidental, this program was established to help all students, not just students injured in intramural sports. The focus of the clinic is diagnosis as well as rehabilitation of athletic injuries.

The intramural department at Oklahoma State University provides students with fifty-two activities ranging from team sports (twenty-four) to individual/dual sports (twenty-eight). Within each sport, leagues are divided into Men's, Women's, and CoRec competition with skill levels ranging from A (highly competitive) to C ("just for fun") according to the Oklahoma State University Campus Recreation Calendar/Handbook (1995-96).

Most team sports leagues are governed by officials trained by the intramural staff. Exceptions to team leagues not governed by officials at Oklahoma State University include walleyball, Ultimate Frisbee, and ooofball. Also at each game site are supervisors who manage the officials and take care of any problems that occur (injuries, protests, equipment or facility failure, and rule interpretations). Captains are informed of all rules for a particular sport at a

captains' meeting prior to the beginning of each sport season. They are then held responsible for informing their teammates of all the rules. An intramural sports council consisting of students from various groups and affiliations across the campus is assembled to help govern discipline problems and hears appeals regarding specific rule interpretations.

Problem

The purpose of this study is to analyze the injury rates of participants in intramural sports at Oklahoma State University. The question to be analyzed is: Can injury rates be decreased if the type of injury and the number of injuries are known? Selected variables to be studied are: 1) year of injury; 2) gender; 3) type of injury; 4) location of injury; 5) sport participating in; 6) facility where injury occurred; and 7) level in school.

Theoretical or Conceptual Formulation

Several factors are prominent in studying the proposed questions. First, the area of injury rate evaluation is not a highly researched area in the field of intramurals but, there are similar studies in the area of varsity athletics and physical education. Second, an effective risk management program should be the first step in becoming aware of possible dangerous situations for participants in a program and trying to decrease the injury rates in intramurals. Third, information for this study comes from accident report forms filled out at the playing site by staff supervisors. Fourth, the structured point of view of this paper will be the data collected from these injury report forms. Finally, current trends in the field include providing trainers at contest sites and at a designated training location.

Hypotheses

1) Participants receive sprain/strain's at the same rate as any other type of injury.
2) Participants receive injuries to the knee and ankle as much as any other location on the body.
3) Basketball has the same injury rates as all other intramural sports.
4) Football has the same injury rates as all other intramural sports.
5) Team sports represent the same injury rates as individual/dual sports.
6) Males have the same injury rate as females.

Definition of Terms

Assumption of Risk

Voluntarily exposing oneself to a known and appreciated danger (van der Smissen, 1990). Participants must assume the risk of any injuries that are normally associated with participation in that activity. However, assumption of risk has little absolute value as a legal defense (Dougherty et al, 1994).

Cause of Injury

Causes of injuries are classified as follows: collision/person; collision/object; kicked; turning/twisting; punched; overuse; throwing; stretching; and running (Lindenfeld, Noyes, and Marshall, 1988).

Death Injury

Fatalities resulting from athletic activities (Calvert, 1976).

Dislocation

A displacement of a part, especially of a bone, from its normal position wherein the articulating surfaces have lost contact (Schafer, 1982).

Documentation

Written information gathering (Esckilson, 1984).

Individual/dual Sports

Sports such as swimming, golf, table tennis, or racquetball that allow the individual to participate alone or against at least one opponent (Mull, Bayless, and Ross, 1987).

Inherent Risk

First, the activity must be a normal, integral part of the sport, not extraneous to it. Second, risk does not mean danger caused by negligence of the defendant. Poor instruction, defective equipment, lack of safety devices, facility layout or construction, poor officiating, and dangerous environmental conditions are all aspects of participation which occasion an undue risk of harm (and, hence, are negligence), which the participant does not assume (van der Smissen, 1990).

Injury

Parameters always include the requirement for medical attention and a resulting restriction of participation (Vinger and Hoerner, 1986). Haines (1994) noted that injury is a result of a complex interaction of many variables such as type of sport, level of competition, equipment used, experience, coaching technique, playing conditions, and the athlete's physical and personality

characteristics.

Injury Rates in Relationship to Participation Rates

The ratio of reported injuries to participation rate was calculated by the formula recommended by Lindenfeld et al. (1988) is used in this study.

$$\text{Injury Rate} = \frac{\text{Number of Injured Players}}{\text{Number of Players Exposed to Injury}}$$

The number of players exposed to injury will now be referred to as participations and will be defined later in this section.

Intramurals

Those sport events that are planned and organized on a recreational basis for members confined within the walls or jurisdiction of a setting (Mull, Bayless, and Ross, 1987). For the purpose of this study, intramurals will take place within the Oklahoma State University community.

Location of Injury

Injury locations for this study are identified as (1) knee, (2) ankle, (3) back/neck, (4) shoulder, (5) thigh/hip/groin, (6) wrist/hand, (7) foot/toe, (8) elbow, (9) head/face, (10) torso, (11) abdomen, (12)mouth, (13) arm, (14)leg, (15) shin, and (16) other.

Participations

The number of "playing opportunities" calculated by multiplying the number of players in a contest at one time by the total number of contests

played in that sport.

Major Injuries

Those which resulted in the participant missing the three or more weeks of scheduled practice or athletic or academic activities following the onset of the injury (Calvert, 1976).

Minor/Moderate Injuries

Those which resulted in the participant missing the athletic activity (whether competition, practice, or instruction) or scheduled academic activities or would have missed it (had it been scheduled) for from one to twenty days following the onset of the injury (Calvert, 1976).

Risk Management

Provides a method for offering quality leisure experiences with maximum protection for participants and adequate safeguards under the law for leaders, administrators, and organizations offering the recreational services (Peterson and Hronek, 1992). Hall and Pitman (1993) define risk management as minimizing the potential for litigation and risk of injury through everyday actions.

Sprains

A joint injury in which the ligaments, capsule, and surrounding tissues are partially torn or severely stretched without dislocation being present. There may have been a partial dislocation that spontaneously reduced itself. The cause is primarily from forcing a range of motion beyond the power of a ligament to withstand the stress such as from overstretching or overexertion

(Schafer, 1982).

Strain

The body is forced to be used in a position that is not favorable to the muscle balance or when the joints are at their physiologic limit of articulation. Thus, pull comes from ligaments rather than muscle (Schafer, 1982).

Team Sports

Such as flag football, basketball, or soccer that require a specified number of players who play as a unit or organized team (Mull, Bayless, and Ross, 1987).

Type of Injury

Injuries were classified into one of (a) sprain/strain, (b) open wound, (c) fracture/bone injury, (d) heat reaction, (e) bruise, (f) head injury, and (g) other (Haines, 1995).

CHAPTER II

Review of Literature

The purpose of this chapter is to report documented information that supports the findings of this study. Included are sections referring to documentation, injuries, related studies, risk, risk management, and athletic training in intramurals/recreational sports.

Documentation

Esckilson (1984) states that written information has become the determining factor in the effectiveness and efficiency of our intramural sports programs and is divided into four fundamental steps: planning; organizing; conducting; and evaluation. This is just the first step in an effective information retrieval system. Based on the data Esckilsen collected, the following five conclusions were evident: (1) the documentation of an intramural sport program, to some degree, is presently being practiced; (2) the documentation of an intramural sports program is a valuable procedure; (3) there are at least 140 items that are valuable to document when programming an intramural sport; (4) four fundamental steps (planning, organizing, conducting, and evaluation) were established as areas for documentation of an intramural sport; and (5) nine sub-programming steps (sport, budget, participants, scheduling, equipment, personnel, publicity, and awards/recognition) were established as areas for documentation of an intramural event.

Haines (1994) suggests that the goals of an effective sports data collection system are primarily to provide factual evidence to protect and defend

the integrity of sports activities.

Ray (1995), the head athletic trainer at Hope College, developed an electronic daily injury report system used to help keep the varsity coaches informed about their injured athletes. The system, which used e-mail, has several benefits including: reducing the time spent producing, copying, and delivering daily injury reports from one hour to approximately ten minutes; reducing the amount of paper used by more than half; and improving the quality and convenience of communication between the athletic training and coaching staffs.

In a study of fourteen Midwest universities, Hall and Pitman (1993) studied injury types, reporting procedures, emergency procedures, staff training, legal problems, and waivers and insurance policies. All of the universities reported that they had a standard accident report form that is filled out following each injury. Five of the directors reported keeping the forms for six years and up, with the remainder of the directors keeping the forms for less time. Sixty-four percent of the directors used a follow-up procedure for injuries to contact the injured by phone or letter within a specified time. The results of the study report that 85% of the injured participants were referred to either the health center or a physician by the person who responded to the injury.

Marcus, O'Donoghue and Stopka (1993) report that the University of Florida's Recreational Sports Athletic Training personnel have developed a program to systematically collect information about injuries incurred during recreational sports sporting events. This information has been recorded on a standardized injury report form and inputted into a data base program. This program is designed to help the staff identify possible injury patterns or trends, so appropriate preventative management strategies can be recommended. The

injury report form goes through several steps before being filed away. The completed injury report form is submitted to the Recreational Sports Department within 24 hours of the injury. Within 24 hours after receiving the form, the injured person is called to: see how they are doing; if he/she had seen a doctor; if he/she wanted additional help; and to obtain a diagnosis if one had been given. If the person was not home, it is documented on the form. The person was to be called three times within a week before the form is filed. Reports were then entered into a data base program which is continually updated to better serve injury data collection purposes. After the initial year of using this process, the data base fields were narrowed to sports which injuries were reported, body part of the injured, and the type of injury.

These references show the importance of documentation within the recreational sports field. Documentation is one way a program can help reduce the liability owed to a participant. Documentation is also a way to track and identify injury trends in a program and can be the first step in preventing injuries in the future.

Injuries

The basic issue of this paper is injuries. The following paragraphs detail specific injuries and how to prevent them. As with one of the hypotheses, this section focuses mainly on injuries to the knee and ankle.

According to Mendryk and Kramer (1978), there is a need for a valid information base to establish appropriate means of preventing injuries. They state that the major problem in injury reportability has been the numerous definitions of a "reportable injury" which have been utilized in past studies. A reportable injury could not be considered as such in all studies owing to the

different criteria used in each study. It is important, they report, to appreciate that the definition of a reportable injury is a practical problem which can never be completely resolved.

Bassett (1994) reports that of all the injuries to the lower extremities in basketball, those of the ankle are the most common. Ankle sprains account for more time lost from basketball practice and games than any other injury. Although this injury is not totally preventable, taping of the ankle before practice and games minimizes the risk of serious sprains and prevents injury altogether in many cases. Bassett reports that acute knee injuries in basketball are, fortunately, rare. Although the knee is exposed to the trauma of twisting and collision, incidence of injury is low.

Barone (1995) states in her article about sneaky sports injuries that pick-up basketball and volleyball are great ways to get injured especially if the participant does not do any other type of exercise. The primary injury she focuses on is jumper's knee. Injury happens when weak or tight leg muscles are repeatedly called upon to jump in the air, with the result being small tears in the tendon that connects the lower leg. Tightness or pain can be felt in the front of the knee when playing basketball, running or sitting for long periods of time, or when trying to straighten the leg.

Irrgang, Miller, and Johnson (1994) report that the knee is the most frequently injured joint in football. Knee injuries account for 22% to 36.5% of all football injuries. They state that other than catastrophic head or neck injuries, knee injuries are the most common reason that the athlete cannot return to participation. It should be noted that their findings were based on full contact football, not flag football. They also state that the ankle is a frequently injured joint in football.

Schafer (1982) finds that head and neck injuries comprise the third highest incidence in sports-related trauma. Probably the most dangerous accidents in sports are those of head injuries- the primary killer in competitive sports. They have insidious beginnings and disastrous potential.

When people hurt themselves, their joints bear the brunt, according to Bloch (1992). He goes on to state that the American Physical Therapy Association has found that the most common injury sites are the knees, feet, back and shoulders, followed by the ankles and hips. The vulnerability of the body's hinges is hardly surprising with each joint consisting of a complex junction of bones, muscles, connective tissue (ligaments and tendons), fascia (a web of fibrous material covering muscle), and fluids.

Flippin (1992) reported that baseball and softball are responsible for more emergency room visits than all other team sports except basketball. He goes on to state that the major cause of all these injuries is base sliding. In a survey of softball leagues in Ann Arbor, Michigan, 70% of injuries came from sliding into anchored bases. When the anchored bases were replaced with breakaway bases, the injuries virtually disappeared. According to an estimate by the Centers for Disease Control, if breakaway bases were instituted nationwide, they would prevent 1.6 million injuries and save about $1.8 billion per year in health care costs.

The ten most common sports injuries are identified by Fuerst (1994). These injuries deal with the injuries adults will commonly face during their lives while recreating. Some of these injuries are directly related to this study at Oklahoma State University. The most common injury that Fuerst identifies is the muscle pull (related to the sprain/strain). The eighth most common injury Fuerst identifies is the ankle sprain, which occurs quite often in the intramural

programs at OSU. Garrick and Webb (1990) report that in clinical practice, knee problems account for nearly 50% of all sports-injury-related patient visits.

According to Goldberg (1989), these injury patterns do not apply to just adults participating in sports. Goldberg stated that basketball is one of the top four sports causing injuries among children. Injury rates ranging from 6% to 31% for children participating in sports have been reported. He also reports that the ankle, knee, and leg were injured most frequently among high school players. Ankle sprains appear to be the most common injury among adolescent players.

Related Studies

The studies in this section relate to this study in some manner. Some of these studies, such as the ones by Kaiser and Stopka and Haines, focus on Campus Recreation injuries instead of just intramurals injuries. Still, other studies (Calvert) reported on injuries to university varsity sports injuries. Only Ramos and Ellis' study reported on intramurals injuries only.

In a four year study from 1983 to 1987 of University of Florida students , Kaiser and Stopka (1990) showed that almost half (49%) of all injuries in recreational sports athletics are to the knee (26%) and the ankle (23%). Of these injuries, basketball (14%) and football (8%) showed the two highest rated team sports injury rates. Regrettably, they felt most injuries could have been prevented or minimized through preventative procedures. Examples of prevention procedures for ankle injuries include taping them or using a brace. Rehabilitation programs involving appropriate strength, flexibility, endurance, and proprioceptive training could be factors helpful in reducing the possibility of recurrent ankle sprains.

In a similar study, Haines (1994) also found that basketball (1:120) and flag football (1:380) along with softball (1:380) had the highest rate of injury in relation to participation. Haines also found that knee (33.1%) and ankle (15.5%) were the most commonly injured body parts.

A study by Calvert (1976) found that the number of major injuries at four year universities and colleges was significantly lower (2882) than minor/major injuries (18,604). Calvert also found that, during the study, no deaths occurred in the 1695 four year universities and colleges studied during the 1975-76 school year.

Going with this trend, Ramos and Ellis (1989) also found in their study at the University of Utah that body parts injured most frequently were the ankle (42.9%) and the knee (31.1%).

Hall and Pitman (1993) studied injury incidence at two California universities with a purpose of (1) to ascertain the type and extent of injuries occurring in this setting, (2) to ascertain what procedures were currently used when handling injuries, and (3) to determine guidelines for a standardized emergency response system appropriate in this setting. Hall and Pitman, along with the studies of Haines, Ramos and Ellis, and Kaiser and Stopka, found that injuries to the ankle (27%) and knee (23%) in University A and injuries to the knee (27%) and ankle (25%) in University B were the most commonly injured body parts. They go on to conclude that sprains are the most common types of injuries at the two universities.

Risk

This section on risk deals with the significance of risk in the recreational setting. Hall and Pitman (1993) report on how much more American society is

willing to sue. Recently, litigation has become an increasingly important factor in recreation facilities and programs.

Ramos and Ellis (1989) report that risk factors in sport injuries can be classified into two categories; extrinsic and intrinsic. Extrinsic factors are related to the following: 1) the sports activity performed; 2) behavior involved in the performance of the activity; 3) quality of equipment used in the activity: and 4) environmental conditions. They go on to address intrinsic factors such as age, sex, injury history, somatotype, physical fitness, and flexibility. Also included in this category are psychological and psychosocial factors like stress and self-concept.

As participation increases and facilities expand in the field of recreational sports, the likelihood of injury also increases (Hall and Pitman, 1993). They also state that our society has become more litigious, causing insurance costs to rise dramatically. Because of these two factors, recreation professionals are being forced to carefully examine their policies and procedures for maintaining high safety standards while minimizing expenses in an expanding environment. Rankin (1982) reports that there really is no special body of law or precedent, (the record of prior cases which helps shape current approaches to law), for intramural sports. She also states that there is a growing body of case law concerning sports and recreation but, on the whole, speculation about what might happen in a particular campus recreation situation must depend upon experience in tort law generally, and, as a universal caution, statutes and judicial decisions in each state may serve to modify the general principles.

Risk Management

Once the importance of risk has been established, it is now crucial to

discuss what can be done to minimize risk. This section will identify ways to reduce risk and the benefits that come with reducing risk.

Rankin (1982) states that probably the only way to eliminate negligence suits is to totally eliminate campus recreation and intramurals. Instead, she suggests four steps to minimize injury and liability that include: (1) Resist the temptation to "make do"; (2) Eliminate those activities which entail high risk with little reward, particularly when there are less dangerous alternatives; (3) Offer insurance policies for trips, hazardous activities, etc. and (4) Hire qualified personnel.

Benefits of an effective risk management plan can include: serving as a deterrent to being sued; showing intent to act responsibly; increasing safety for the consumers of your services; reducing losses to an organization; using available funds more effectively; identifying exposures one can cover through an alternative to insurance; increasing attractiveness to insurance companies; reducing uncertainties associated with future projects; and easier monitoring of claims, losses, and insurance coverage (Peterson and Hronek, 1992).

Parsons (1984) addresses three concerns regarding risk management for the contemporary sports administrator. First, the administrator must determine what types of programming risks will be taken. One extreme of this decision are to not allow any potentially high-risk activities to take place within the program. The other extreme is to allow all activities that promote all avenues of sport participation. Parsons suggest a program to take some stand in between these extremes. Second, the administrator needs to weigh the options of not worrying about every aspect of risk management if well-qualified colleagues have been delegated sufficient authority to successfully execute their responsibilities. The third concern an administrator should address is

whether the ideal procedures throughout all of our written materials, staff manuals, supervisors' manuals, and all the in-service lectures and briefings by memo and/or mass meetings have an impact on the on-site supervisor.

A risk management plan systematically analyzes the services offered for personal injury and financial loss potential and selects approaches to handle such losses (van der Smissen, 1990). She also goes on to state that a risk management plan sets forth the basic policies and the implementing operational practices and procedures of the approaches which will be utilized to manage the identified risks of loss. More specific objectives include: 1) preventing damage or destruction to property; 2) reducing or preventing possible injury or suffering to individuals; 3) instituting loss-reducing and reducing prevention programs; and 4) shifting through transfer mechanisms those losses which cannot be controlled by other means.

Administrators have two options to identifying risks within a program, according to Kaiser (1986). The first is to retain the services of an insurance consultant to identify risks. The second is to identify risks with existing staff. Risk analysis questionnaires are available from individual insurance companies, insurance publishing companies, or the Insurance Division of the American Management Association to assist the manager with self analysis and must be structured to meet individual agency needs.

The Coalition of Americans to Protect Sports (CAPS) has expanded its role in today's litigious society (Lincoln, 1992). In addition to its ongoing efforts to change liability laws at the federal levels, as well as tort reforms at the local level, CAPS now offers a risk education program. The program is designed to help administrators build their offensive game plan by teaching them how to (1) identify potential hazards; (2) reduce liability; (3) upgrade safety; (4) reduce

insurance claims and costs; and (5) minimize risk litigation. She goes on to state that the largest number of sports participants in America, participating on the lowest levels-intramural and park and recreation-are the ones who are most affected by liability and litigation. CAPS created its program to help the sports community maximize athlete safety while minimizing the potential for liability litigation, by educating sports professionals and volunteers about their legal responsibilities and assisting sports providers in implementing safety measures to protect athletes, as well as the provide a complete record-keeping system of risk management through the use of comprehensive checklists. The goal of CAPS is to make the program materials available to every school athletic program (elementary, high school, and college), parks and recreation departments, and amateur, youth, and community league at low costs.

Bloch (1992) states that the best medicine for sports injuries, of course, is to avoid getting hurt in the first place. He suggests the following ways to help lower the risk of getting hurt: (1) don't overdo exercise; (2) use safe equipment; (3) try to bring a relaxed frame of mind to your workout; (4) warm up and cool down; (5) work on your weak link; (6) recognize an injury's warning signs; and (7) take up cross training.

Daniels (1984) provides some guidelines that can assist in generating a risk management program. In the area of programs, she suggests the following guidelines: (1) ensure that appropriate clothing and shoes are worn; (2) establish and enforce safety rule, regulations, and procedures; (3) provide recreational sport opportunities based on the size, age, skill, physical condition, and competitive interest of the participants; (4) provide protective equipment and teach participants how to use it; (5) provide an adequate number of qualified personnel for each activity; (6) have all participants sign an

"Acceptance of Risk" agreement certifying their informed awareness and comprehension of the risk of injury they are accepting by participating; and (7) encourage participants to carry health/accident insurance.

Athletic Training in Intramurals/Recreational Sports

As recreation departments are being held to a higher standard of care for their participants, athletic training is beginning to become more and more important.

A current trend in recreational sports is for those departments to provide athletic trainers for their participants. Marcus, O'Donoghue, and Stopka (1993) report that athletic trainers are concerned with injury prevention, recognition, and evaluation, as well as the management, treatment, disposition, rehabilitation, organization and administration, education, and counseling of the injured. Although taping and injury evaluation are vital parts of an athletic trainer's job, they are continually called upon and expected to offer advice on appropriate shoe selection, nutrition, training techniques, therapeutic exercise and more. They go on to report that recreational sports programs at the university level can benefit from having an athletic trainer in a variety of ways. The athletic trainer's knowledge, skills, and services can greatly enhance the program. The presence of a certified athletic trainer provides direct medical, educational, and legal benefits to the program. In addition, the employment of a certified athletic trainer will decrease the possibility of litigation being brought against the program.

Gaskins (1994) states that common tasks of athletic training in recreational sports include taping, injury care and evaluation, emergency medical response, selection of appropriate fitness equipment and apparel,

nutrition, training techniques, therapeutic techniques, therapeutic exercise, rehabilitation, fitness assessments, and accident report record keeping and analysis. Gaskins also reports that despite the need for injury prevention, budgetary restrictions, the difficulty in attracting qualified personnel or concerns regarding liability, limit the majority of institutions to a much less comprehensive approach to the safety services dilemma. He stated that 83% of the schools responding to his study reported that certifications were mandated for student and professional staff in certain positions. Those pertaining to intramurals include intramural supervisors (50%) and professional staff and graduate assistants (35%).

Deivert (1989) discusses the Recreational Sports Department's Emergency Medical Coverage Program in use at Penn State University. He tells of a cooperative program between the Recreational Sports Department and the Athletic Training Education Department that covers 17 different sports, six multipurpose outdoor play areas, four indoor facilities, and approximately 19,500 participants each year. This program utilizes the services of a full-time certified athletic trainer, two graduate students who are certified athletic trainers, student athletic trainers, and officials to tend to injured participants. Deivert stresses that success to the program can only come from a well-trained and cooperative staff.

CHAPTER III

Method

The purpose of this study is to analyze intramural sports injury rates at Oklahoma State University. Lindenfeld, Noyes, and Marshall (1988) report that the practical aspects of performing an injury study contains several key elements that include: data collectors collect data unreliably; questions are too many or too complex; study participants refuse, or are unable, to provide the data; data may be lost; and data that rely upon the memory of the participant may be lost forever. This study will address these issues where applicable. The population to be sampled are the accident report forms filled out by on-site supervisors at intramural activities at Oklahoma State. Injured participants can include the students, faculty, and staff of Oklahoma State University. This study will evaluate a three year period of injuries beginning in the 1992-93 school year and ending with the 1994-95 school year. Approximately one hundred injuries occur in the intramural program each year with a total sample size of about 300. At this point, the study will assume that the on-site supervisors were trained properly in how to fill out the forms and did so accordingly. A limitation that may occur includes injuries that were not reported and, therefore, did not have an accident report form documenting the injury.

The accident report forms used by the Campus Recreation staff at Oklahoma State University are divided into four sections: demographic data; physical location; personal injury; and action taken. Demographic data required includes date, time, staff name, name of injured, University identification number, address of injured, phone number of injured, gender of the participant, year in school, guest of whom, guest's address, and witness

name and address. Physical location information needed includes accident location (intramurals, campus recreation class, Health, Physical Education, and Leisure (HPEL) class, summer camps, and special events), area injury occurred (Colvin Center, Annex, Camp Redlands, and outside of building), and a description of the exact location and any physical conditions pertaining to the accident. A description of the exact location of the injury (on the body) and a brief description of the injury and how it occurred are needed for the personal injury section of the form. The action taken section contains what first aid was applied and by whom (respondent's name, position, how injured was moved, and by whom), if the injured refused treatment, injured signature, staff signature, and the office follow-up of the injury. Marcus, O'Donoghue, and Stopka (1993) state the importance of documenting injuries by stating that, along with injury prevention and the hiring of necessary personnel, accurate and complete documentation of injuries and services is the best way for protection against liability

Accident report forms for this study are on file in the Campus Recreation office and were readily available. These files will be the database for this study. Sandago (1984) stresses the importance of documentation in the reduction of liability by asking five questions. 1) Does the documentation process exist? 2) Who is responsible for filling out the injury report? 3) How are the persons filling out the form trained? 4) Is there follow-up on each injury reported? 5) Are there statistics kept from these files? Data will be analyzed based on the information retrieved from the accident report forms and appropriate statistical analyses will be applied to test the hypotheses. The research instrument applied to this paper will be developed by the author.

Data will be classified into the following elements: *gender; cause of*

injury; type of injury; severity of injury; location of injury; sport participating in; facility where injury occurred; year in school; and year of injury. A quasi-experimental design will be used in this study because information will be drawn from past information from the program and only one group is analyzed (injuries reported). Participants can be assured that they cannot be identified from the analysis and results of the data.

The data collection instrument consists of eight elements divided into the following categories: year of injury; gender; type of injury; location of injury; sport participating in; facility where injury occurred; and level in school. It is important , at this time, to discuss the facility element of the data collection instrument. This element is divided into thirteen categories based on where intramural activities take place. The basketball court category includes all activities that take place on the Colvin Center basketball courts and are a hardwood surface. The racquetball court category includes all activities that take place on the Colvin Center racquetball courts. The outdoor fields category within this element are all of the Campus Recreation fields utilized for intramural use. Any sand volleyball court used by intramurals falls into the sand volleyball court category. Any injury reported in the Colvin Center indoor pool would be listed in the indoor pool category. Any injury reported in the Colvin Center outdoor pool would be listed in the outdoor pool category. Off campus locations on the data collection instrument include The Cue pool hall, Frontier Lanes (bowling), Boomer Lake disc golf course, Lakeside Memorial Park Golf Course, and the Cowboy Sportsplex (mini golf). The Colvin Center Annex courts is the next category in this element and is listed separate because the courts are a tartan surface. The wrestling mat category is listed next and is set up in the Colvin Center courts. Hedge Field, an outdoor grass field, is also listed

separately because its use is limited by varsity athletic and sports clubs use. Lewis Field is an outdoor, artificial turf field used primarily for varsity football. The tennis court category consists of any tennis court owned by Oklahoma State University.

Specific analyses used in this study include means comparison and cross tabulations of results.

CHAPTER IV

Results

Results from the analysis could demand the following: rule modifications; more skill level requirements; stricter rule enforcement; cancellation of dangerous events; better facilities and equipment; and decreased competitiveness. One question to be asked is if the injury rates for any or all intramural activities is too high. Hypotheses for this study are listed below.

1) Participants receive sprain/strain's at the same rate as any other type of injury.
2) Participants receive injuries to the knee and ankle as much as any other location on the body.
3) Basketball has the same injury rates as all other intramural sports.
4) Football has the same injury rates as all other intramural sports.
5) Team sports represent the same injury rates as individual/dual sports
6) Males have the same injury rate as females.

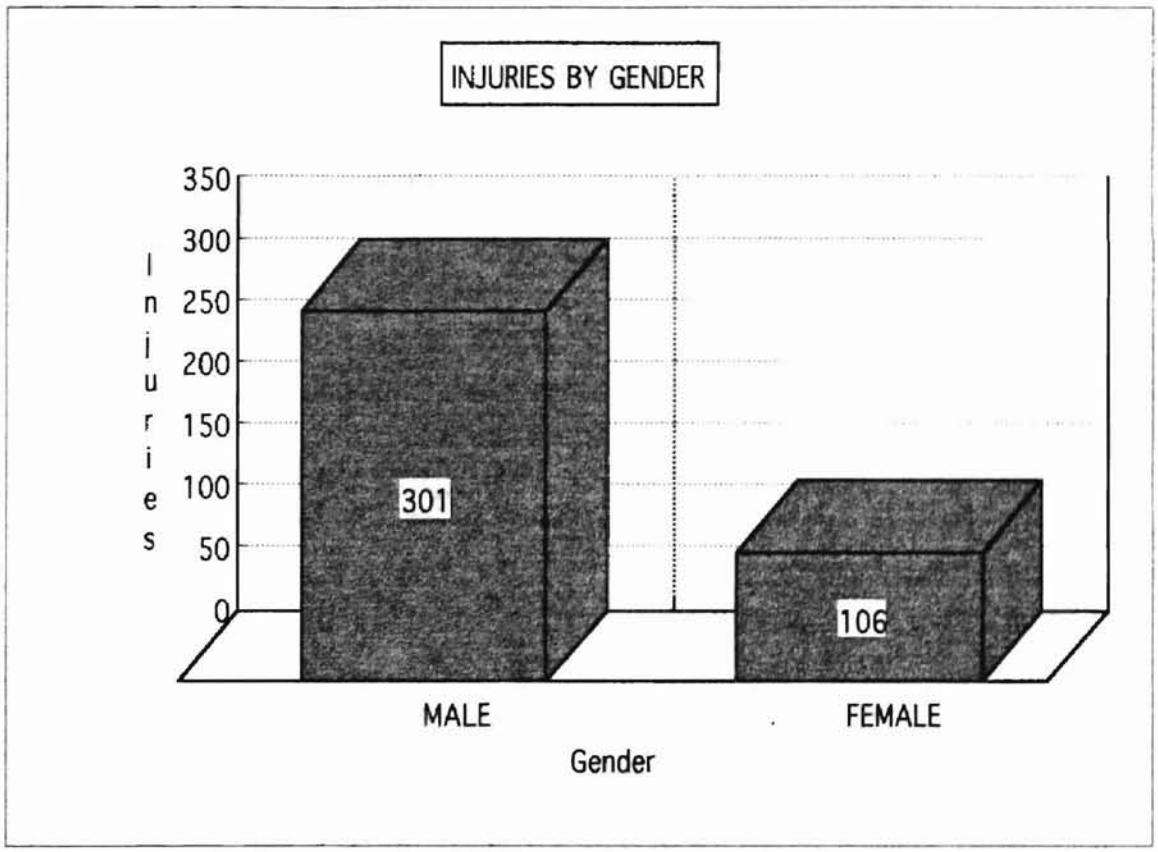
This chapter will discuss the differences in the injury rates of intramural activities at Oklahoma State University. Results were based on comparing two elements to each other.

Between the 1992-93 school year and the 1994-95 school year, 441 injuries were reported to on-site supervisors that were a direct result from participating in intramurals. Of the 441 reported injuries, 407 accident report forms were deemed usable. The other 34 forms were not used because pertinent information had not been reported or reported incorrectly.

Injury Totals

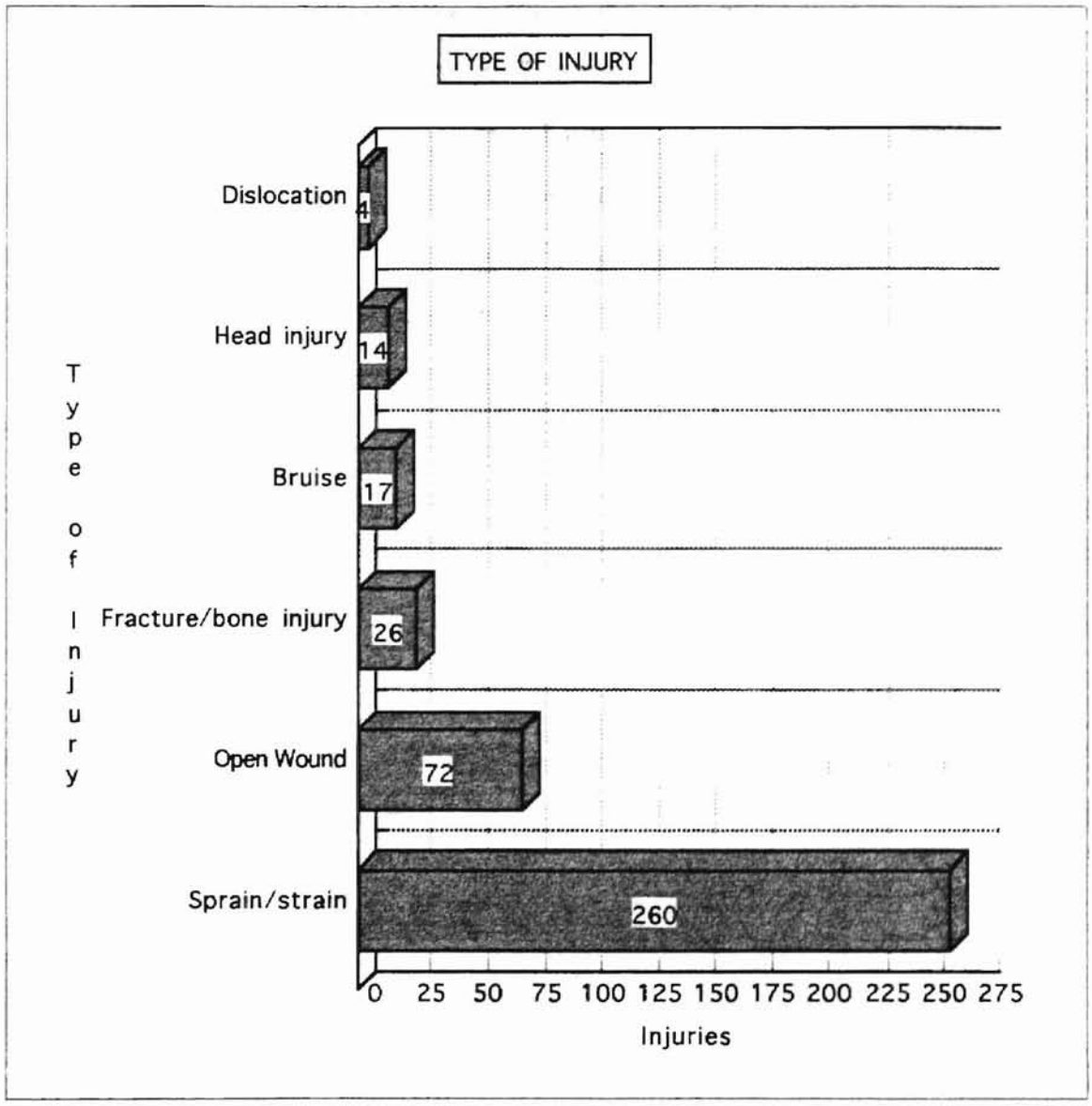
Of the 407 reported injuries (usable accident report forms), 135 occurred during the 1992-93 school year accounting for 33.17% of the total injuries. The 1993-94 school year had 119 total injuries for a 29.24% of the total injuries. The 1994-95 school year reported 153 injuries that attributed for 37.59% of the total injuries.

Males in intramural activities sustained 301 injuries accounting for 73.96% of the 407 reported injuries in the *gender* element of the study. Females sustained the other 106 injuries for 26.04% of the total injuries. The following graph depicts injuries by gender.

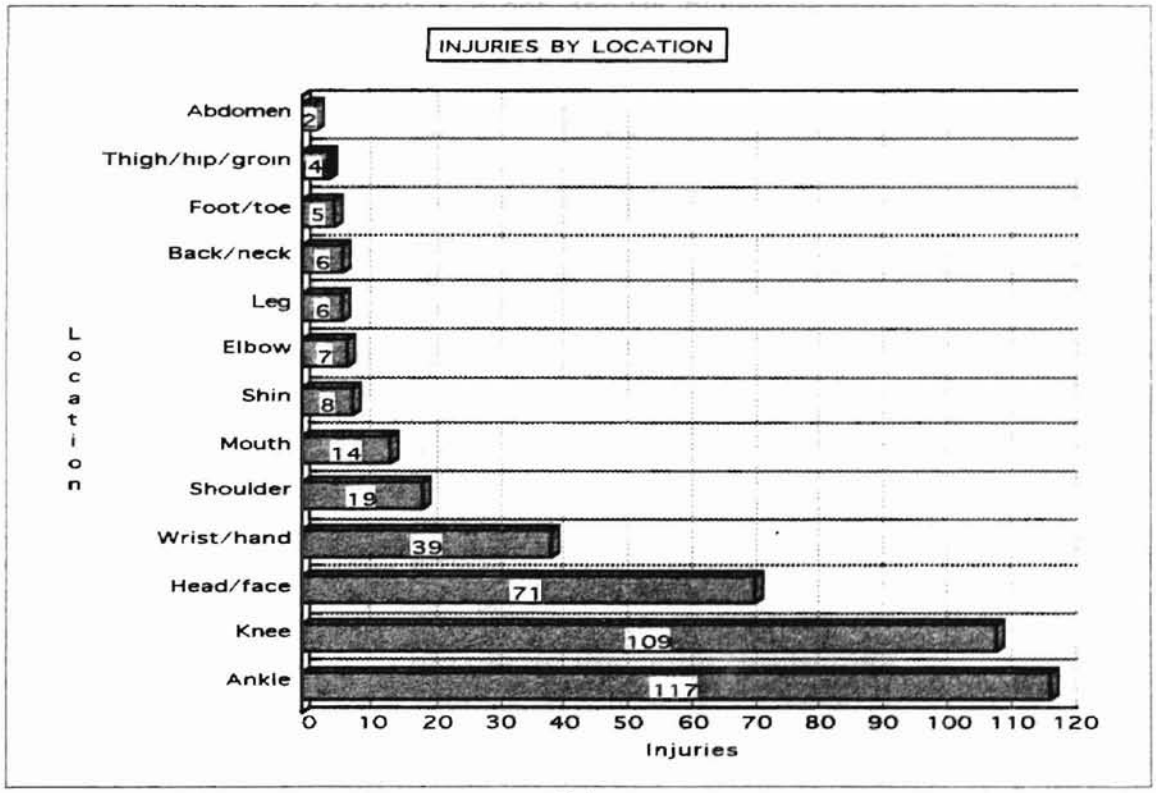


Of the eight categories within the *type of injury* element, no heat

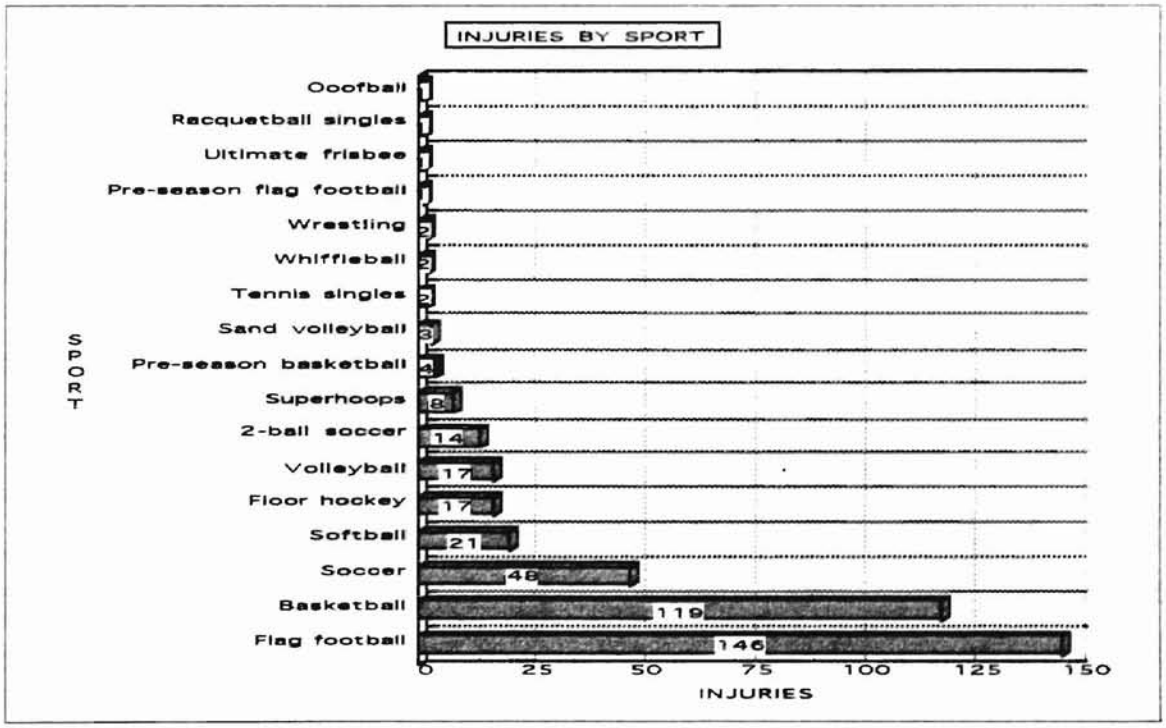
reactions or "other" injuries were reported. There were 260 sprain/strains sustained for 63.88% of the total injuries. Open wounds accounted for 72 injuries an a 17.69% share of the total injuries. Fracture/bone injuries were reported 26 times an account for 6.39% of all injuries. Seventeen bruise injuries were reported by intramural participants for 7.62% of all injuries. Fourteen injuries to the head accounted for 3.44% of all injuries. The last category of reported injuries was dislocation where 4 were reported for a .98% of the total. The following graph depicts injuries by type.



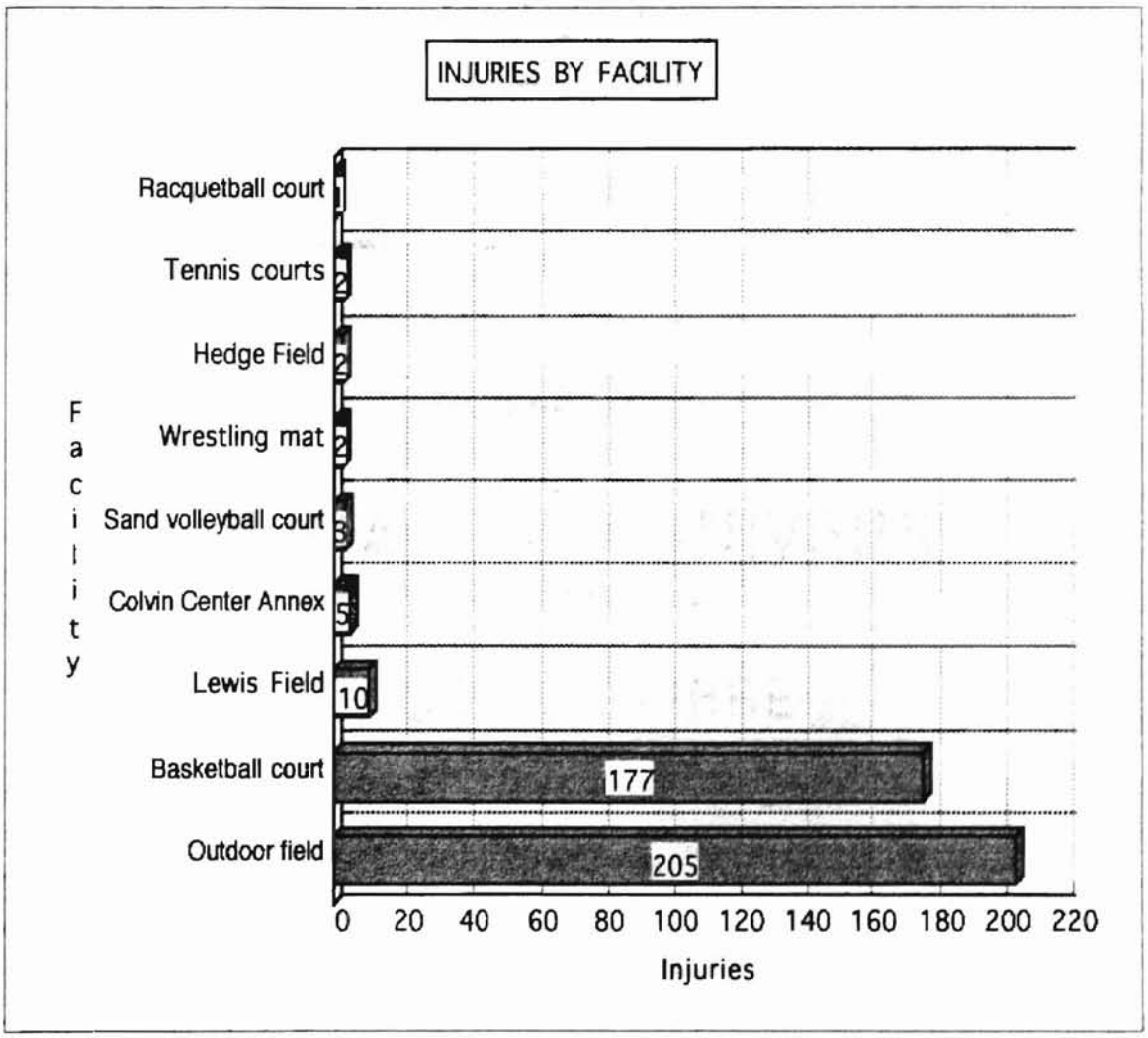
Location of injury is the next element to be discussed. The arm and torso were the only categories from this element with no reported injuries. Injuries to the knee totaled 109 for 26.78% of the total injuries. Ankle injuries accounted for 28.75% of the total injuries with 117 reported cases. Back/neck injuries totaled 6 for 1.47% of all injuries. Nineteen shoulder injuries by intramural participants amassed 4.67% of all reported injuries. Thigh/hip/groin injuries accounted for 4 of the 407 injuries and a .98% share of the total amount. Injuries to the wrist/hand resulted in a 9.58% of all injuries with 39 reported cases. Five injuries to the foot/toe resulted in 1.23% of the total reported injuries. Elbow injuries accounted for 7 of the 407 injuries and a 1.72% share of all injuries. Head/face injuries totaled 71 for a 17.44% share of all injuries. Injuries to the mouth totaled 2 for a .49% share of the total injuries. Six injuries to the leg by participants amassed a 1.47% of the total injuries. Eight injuries to the shin resulted in a 1.97% total of all injuries.



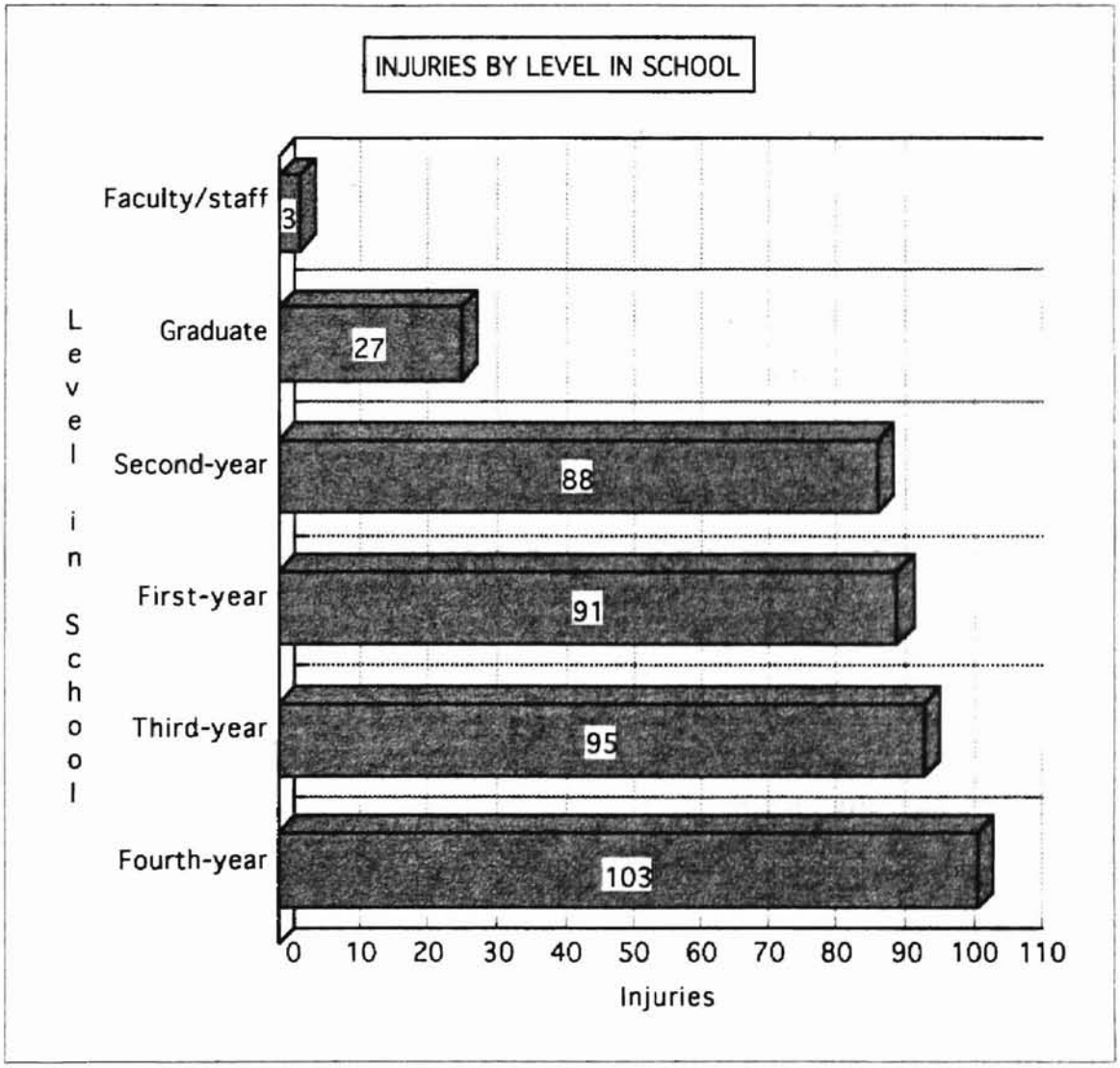
The next element to be discussed is the *sport* element. Seventeen of the fifty-two intramural activities researched reported injuries within the three years of the study. One hundred forty-six injuries occurred in flag football for a 35.87% total of all injuries. Pre-season flag football , ultimate Frisbee, racquetball singles and ooofball each had one injury and each accounted for .25% of the total injuries. Tennis singles, whiffleball, and wrestling each had two reported injuries during the study for a .49% of the total injuries. There were 17 injuries in volleyball for a 4.18% share of all injuries. Superhoops accounted for 8 of the 407 injuries and a 1.97% share of injuries. Fourteen injuries were reported in 2-ball soccer with a 3.44% total of all injuries. Pre-season basketball resulted in .98% of all injuries with 4 reported. Basketball had 119 injuries for a 29.24% share of all injuries. Forty-eight soccer injuries resulted in a 11.79% of all injuries. Softball reported 21 injuries and a 5.16% share of the total injuries. Sand volleyball accounted for .74% of all injuries with 3 reported cases. The following graph depicts injuries by sport.



Within the *facility* element, 177 injuries occurred on the Colvin Center basketball courts accounting for 43.49% of all reported cases. One injury occurred on a racquetball court resulting in a .25% share of all injuries. Outdoor fields accounted for 205 injuries and 50.38% of all injuries. Three injuries occurred on sand volleyball courts and totaled .74% of all injuries. The Colvin Center Annex courts had 5 injuries occur at the site by intramural participants for a 1.23% share of the total injuries. Wrestling mats, Hedge Field, and tennis courts each had two injuries with a total of all injuries occur on them for a 2.46% share of all injuries for each sport. Lewis Field had 10 injuries accounting for 2.46% of the total injuries. The following graph depicts injuries by facility.



The last element to be discussed is the *level of school* (or affiliation to the school) element. First-year students accounted for 91 injuries and a 22.36% share of all injuries during the last three years. Second-year students reported 88 injuries for 21.62% of all injuries. Ninety-five injuries to third-year students resulted in a 23.34% share of all injuries. Fourth-year students received 103 injuries that totaled 25.31% of all injuries. Graduate students received 27 injuries accounting for 6.63% of the total injuries. Three injuries occurred to faculty/staff for a .74% share of all injuries. The following graph depicts injuries by level in school.



Participations

Before injury rates can be addressed, participations must be totaled. Participations are are "total play opportunities". For example, a team of five basketball players playing in a five game regular season would total twenty-five participations for that sport. Participations are calculated at Oklahoma State University by multiplying the number of people in a contest at one time by the number of contests played in the league.

During the three years of this study, the participants of Oklahoma State University totaled 134,584 participations in intramural contests. This total includes all team, meet, special events, and individual/dual sports. In the 1992-93 school year, participants amassed 52,874 participations. In the 1993-94 school year, intramural sports had 40,181 participations. During the 1994-95 school year, 41,524 participations were counted.

Of the 52,874 participations in 1992-93, 50,057 of them were in team sports, 429 in individual/dual sports, 984 in meets, and 1404 in special events. The 40,181 participations in the 1993-94 school year were divided into 33,430 team sport participations, 3491 individual/dual participations, 950 meet participations, and 2310 special events participations. The 41,529 1994-95 participations were divided into 33,216 team participations, 4431 individual/dual participations, 812 meet participations, and 3070 special event participations.

When combining all three years, team sport participations totaled 116,703, individual/dual participations totaled 8357, meet participations totaled 2746, and special event participations totaled 6784. The following table illustrates the injury rates during the three years of the study.

YEAR	INJURIES	PARTICIPATIONS	INJURY RATE
1992-93	135	42,540	1:315
1993-94	119	31,687	1:266
1994-95	153	34,219	1:201
TOTALS	407	108,446	1:266

It should be explained that the totals for participations were calculated in a different manner before the 1993-94 school year. For this reason, the totals for participations and injury rates from this point will use only the data from the 1993-94 and 1994-95 school years.

During the 1993-94 and 1994-95 school years, thirteen sports had a total of 272 injuries occur in them. In these thirteen sports, there were 63,594 participations and an injury rate of 1:234. For that period, the injury rate for all sports was 1:248. The following table shows the injury rates for sports that had injuries in the 1993-94 and 1994-95 school years. Any sport not listed did not have any injuries in that period and therefore had an injury rate of zero.

The chart below shows that of the sports that reported injuries. Softball had the lowest injury rate (1:1178). Floor Hockey, by far, had the highest injury rate (1:42).

INJURY RATES FOR 1993-94 & 1994-95

SPORT	INJURIES	PARTICIPATIONS	INJURY RATE
Flag Football	107	13,944	1:130
Tennis Singles	1	568	1:568
Volleyball	10	6924	1:692
Superhoops	3	1198	1:399
2-Ball Soccer	10	3276	1:327
Pre-Season BB	2	240	1:120
Basketball	68	13,000	1:191
Soccer	37	6842	1:185

Ooofball	1	290	1:290
Softball	12	14,140	1:1178
Wrestling	2	514	1:257
Floor Hockey	16	672	1:42
Sand Volleyball	3	1986	1:662
Totals	**272**	**63,594**	**1:234**

Hypotheses

1) Participants receive sprain/strains at the same rate as any other type of injury.

After analyzing the data from this study at Oklahoma State University, it was found that participants do **not** receive sprains/strains at the same rate as any other type of injury. In fact, participants receiving this injury were in the majority with 260 of the 407 usable injury cases (63.88%) considered a sprain/strain.

2) Participants receive injuries to the knee and ankle as much as any other location on the body.

The results of this study showed that these two locations of injury were more frequent, by far, than any other location on the body. Injuries to the knee accounted for 26.78% of all injuries reported with 109 total. Injuries to the ankle totaled 117 for a 28.75% share of the total injuries. These two totals were considerably higher than any other location on the body. The next highest total in this element was injuries to the head/face with 71 reported cases for a 17.44% share of the total injuries.

3) Basketball has the same injury rate as all other intramural

sports.

Basketball, with an injury rate of 1:191, does not have the same injury rate as other intramural sports. It does have the second highest total of injuries sustained in a sport, but it has the fifth highest injury rate behind floor hockey, pre-season basketball, flag football, and soccer.

4) Football has the same injury rate as all other intramural sports.

Like basketball, football does not have the same injury rate as other intramural sports. It does have the highest total of injuries sustained in a sport (146), but has the third highest injury rate (1:130) only behind floor hockey and pre-season basketball.

5) Team sports represent the same injury rates as individual/dual sports.

Team sports represent a higher injury rate, not the same injury rate, as individual/dual sports in intramural activities at Oklahoma State University. Of the team sports that reported injuries in the 1993-94 and 1994-95 school years, the injury rate for team sports was 1:233. The only individual/dual sport that recorded an injury in that same period was tennis singles with one reported injury and an injury rate of 1:568.

6) Males have the same injury rate as females.

This hypothesis could not be tested because total participations could not be figured for males and females because of CoRec competition. Within CoRec competition, it could not be determined if an injury to a female occurred in Women's competition or in CoRec competition. The same can be said for

injuries that occurred to males in CoRec competition. Also, participations that happened in CoRec leagues could not be split into male and female participations.

CHAPTER V

Summary

The present study is an analysis of injuries that occur in the intramural department at Oklahoma State University. It was hypothesized that : 1) participants would receive sprain/strain's at the same rate as any other type of injury; 2) participants would receive injuries to the knee and ankle as much as any other location of the body; 3) basketball has the same injury rates as all other intramural sports; 4) football has the same injury rates as all other intramural sports; 5) team sports represent the same injury rates as individual/dual sports; and 6) males have the same injury rates as females.

The sample was composed of all accident reports that were recorded in the intramural department at Oklahoma State University during a three year span that included the 1992-93, 1993-94, and 1994-95 school years. Of the 440 reported accident report forms during that span, 407 were deemed usable for this study.

One summarization to be addressed in this study is that the safety of the Intramural Department at Oklahoma State University is better than critics of the program assumed. The main purpose for the study addressing injury rates within the department was that some students believed that the intramural department was dangerous. From the critical comments and editorials in the campus newspaper to the general feeling of the participants after these reports were published, many people around campus felt that intramurals were dangerous. After studying the injury rates in the department, the researcher can now say that the intramural department's programs are not the "injury trap" of the university. When considering the thousands of participations that occur

every year within the department, the injury rates are not as high as the critics were quick to point out to the student population. Although no injury should be looked upon as acceptable, it should be noted that the inherent risks of the program and the nature of sport will always result in injuries that occur naturally within an activity.

At what point should an administrator be concerned with injury rates? The researcher suggests that an administrator of an intramural program should always be concerned with injury rates within his/her program. They should be alarmed when this level reaches the recommendation suggested by the researcher at the end of this section. Who determines when an injury rate is acceptable? This level should be determined by those closest to the program: the intramural director, those supervising the director, and any insurance company involved with the program.

What is an acceptable injury rate level? Conclusions are based on several factors. The first factor is comparing similar studies outlined in this study with the findings at Oklahoma State University. These studies include Green-Hall and Pitman's, DeHaven and Litner's, Kaiser and Stopka's, Haines', and Ramos and Ellis'. The second factor is a discussion with an insurance company that insures university intramural programs. Costs of policies are based on the number of participants involved in the program, the distribution of male and female participants, the number of injuries sustained within the program, and past injury rates within the program. Although information from a similar intramural program to OSU's for comparison could not be retreived for this study, the basic factors for defining an acceptable injury rate were discovered. It is important to remember that each university insured by this company had a specific injury rate defined by these variables. No two university policies are

identical because of differences in facilities used in the program, rule regulations, rule enforcement, definition of injuries, and past history of injury rates. The final factor in determinig an acceptable injury rate level for the intramural program at Oklahoma State University is the personal beliefs of the researcher based on the findings of this study. The researcher suggests that an acceptable injury rate for a specific sport be not more than 1:100 as defined in this study.

Discussion

Kaiser and Stopka (1990) reported that in 1987, 46% of all injuries in their study of the Division of Recreational Sports at the University of Florida were either to the knee (24%) or ankle (22%). In comparison, this study at Oklahoma State University shows that during the three year time period analyzed, 55.53% of all intramural injuries were to the knee (26.78%) and ankle (28.75%).

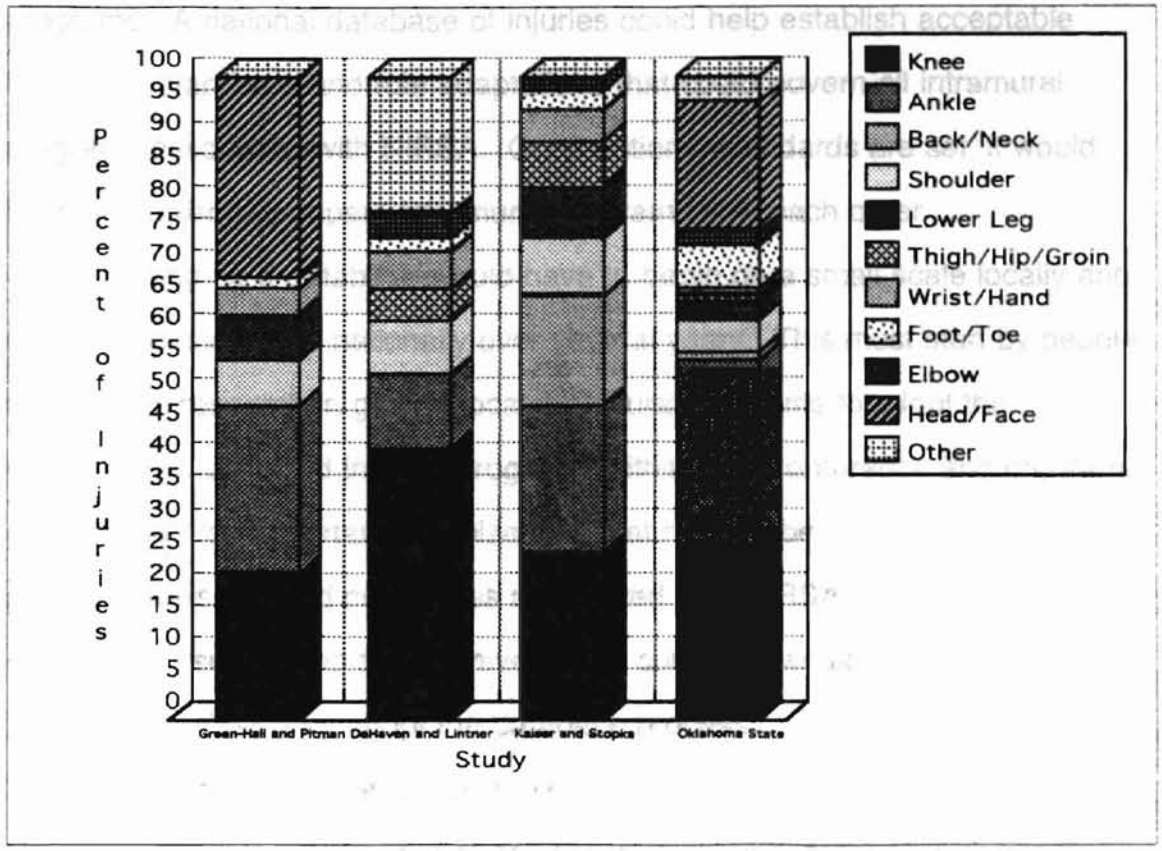
Kaiser and Stopka also found that basketball and football had more injuries than any other sport. Basketball accounted for 14.4% (239) of all injuries while football accounted for 8.1% (135) of the total injuries. It should be noted that in Kaiser and Stopka's study, all recreational activity injuries were documented, not just intramural injuries. At Oklahoma State University, basketball and football were also found to be the sports having the most injuries. Basketball accounted for 35.87% (119) of all injuries while football accounted for 29.24% of the total intramural injuries.

When looking at just basketball activities at Oklahoma State University, 32.19% (131) of all injuries during this study occurred during some form of intramural basketball activity (Pre-Season Basketball, Basketball, and

Superhoops).

One major difference between Kaiser and Stopka's study and this study is injuries to the head. In the study at the University of Florida, three head/face injuries were reported that accounted for less than 1% of the total reported injuries. At Oklahoma State University, 85 head/face and mouth injuries were reported accounting for 20.88% of the total intramural injuries. The head and face injuries at Oklahoma State University should be a concern for the intramural program. Of the 71 injuries to the head/face reported in intramurals, 11.27% of them occurred in Floor Hockey. Also, 7.14% of all injuries to the mouth reported were in Floor Hockey. These two types of injuries accounted for 52.94% of all the injuries reported in Floor Hockey. This is an extremely high amount of injuries to the head area in one sport.

In comparison, Hall and Pitman (1993) found that in their study of two universities that 26% of all reported injuries were to the ankle and 25% of all injuries reported were to the knee. Injuries to the head/face ranged from 32% in one university to 21% at the other university. The graph on the following page depicts a comparison of the studies.



Recommendations For Future Study

1) It is recommended that this study can be expanded to include all injuries that occur in the Campus Recreation Department at Oklahoma State University instead of injuries occurring only in the intramural department. Analyzing all the injuries could lead to improvements in safety for the entire department, not just the intramural department.

2) It is also recommended that the analysis of injuries in the Campus Recreation Department at Oklahoma State University be compared to the injury rates of universities across the country. This would be important to help establish a national database for injuries for all Campus Recreation Departments. Once the data is analyzed, national regulations could be discussed and established to provide for the safety of the participants in these

programs. A national database of injuries could help establish acceptable injury rate standards and rule adaptations that could govern all intramural programs associated with NIRSA. Once national standards are set, it would become easier to compare intramural programs with each other.

Setting up a database would have to begin on a small scale locally and expand regionally and nationally over several years. This must start by people, such as the researcher, getting local intramural programs to adopt the database. This should include programs within their conference and programs of close friends. Important organizations that need to be included are NIRSA and all universities and companies associated with NIRSA. Ultimately, it is the researcher's suggestion that a university or company would not be allowed to join NIRSA unless they adopt the database process.

3) It is recommended that future studies focus on several, more specific factors. These factors include: the time of day the injury occurred; the time during the contest the injury occurred; and what part of the season the injury occurred. Considering these factors and their injury rates may help administrators define problems or concerns of the department and propose possible solutions for them.

Recommendations

This section of the paper will cover what, if any, changes are recommended to the programs of the intramural department at Oklahoma State University based on the findings of the study. These topics include floor hockey, a database, the accident report form, flag football, injury data collection, an alternate definition of injury rates and all involve defining the problem and recommending a possible solution. All of the following recommendations were proposed by the researcher.

1. Floor Hockey

The first area in which in which changes are recommended is the activity of floor hockey. Because floor hockey's injury rate was considerably higher than any of the other activities, some changes should be made to make it a safer sport. The researcher recommends that play be on a large enough area to give players enough room to maneuver. In the 1994-95 school year, injuries in floor hockey increased dramatically. The injury rate for that year was 1:18 with 15 injuries in 276 participations. The year before, 1993-94, the injury rate was 1:396 with one injury occurring in 396 participations. The difference between these two seasons was location. In 1993-94, floor hockey was played in an area covering three basketball courts. The following year, in 1994-95, floor hockey was played in an area covering two basketball courts with no major rule changes between the two seasons. Therefore, it is thought that the playing surface was too small during the 1994-95 season and caused more injuries because the participants did not have enough room to maneuver. Other recommendations for floor hockey include providing protective eye equipment for players, requiring mouth guards, enforcing all rules strictly, and educating all players about rule enforcement and penalties.

It should be noted that in the 1995-96 school year, floor hockey was again played on an area of three basketball courts. As proposed by the researcher, the injury rate dropped substantially. During this season, 5 injuries were reported during 350 participations for an injury rate of 1:70. The researcher recommends that future floor hockey leagues be played on a court covering at least three basketball courts.

2. Database

All accidents should be entered into a database where they can be accessed and analyzed easily. Once each injury is entered into the database, statistics based on the injuries can be withdrawn and used for a number of purposes including supporting the program with favorable statistics and analyzing injury patterns that point to a specific problem. The researcher will help set up such a database for the Campus Recreation Department at Oklahoma State University.

3. Accident Report Form

There is a need to reformat the present accident report form presently used in the Campus Recreation Department at Oklahoma State University so that it can be easily filled out and entered into a computer database. The form also needed additional topics in some areas. Although the initial time needed to set up the system may seem long, the convenience of the system will be seen as worth the time and effort of creating it. Many of the sections on the new accident report form were coded with numbers so that they could be entered into the computer with as few keystrokes as possible. The sections of the new form include: Personal Information; Facility; Department; Injury; Action Taken; and Follow-Up. Once completed, the new accident form will be recommended for use in the Campus Recreation Department at Oklahoma State University.

Differences in the personal information section of the new form when compared to the old form include: asking for the age of the injured; requiring two witnesses names, addresses, and phone numbers; and asking for the host's phone number instead of the guest's address. Asking for the host's phone number seemed logical because the most hosts will have a local address and, therefore, will be easier to contact if needed.

Colvin fields, tennis courts, sand volleyball courts, Lewis Field, Willis field, indoor pool, outdoor pool and "other" were added to the Facility section. Also added to the facility list is an area to describe the conditions of the facility and the activity the injured was participating in.

Added to the Department section of the form was a place to list the activity the injury occurred in along with adding NYSP (National Youth Sports Program) and "other" to the list.

The Injury section changed by providing a specific checklist of the type of injury sustained. This is the same list used for this study and included: Ankle; Knee; Back/Neck; Shoulder; Thigh/Hip/Groin; Wrist/Hand; Foot/Toe; Elbow; Head/Face; Mouth; Torso; Abdomen; Arm; Leg; Shin; and Other. The form also asks to indicate right or left if applicable.

The Action Taken section asks for several "yes" or "no" answers. The first question is "Was First Aid applied?" If the the answer to the first question was "yes", then the person who applied the First Aid and their position would be noted. The next question asked is "Was treatment refused?" followed by "Ambulance called?" If an ambulance was not called, then the form asks how the injured was moved. The final requirements of this section was to have the staff attending the injury and the injured participant sign the form.

The Follow-Up section requires that the injured try to be contacted up to four times. Each time a call is made the date and time along with the callers initials and result of the call are required. If the injured is contacted, the results of the injury should be noted in the proper place. The last question asked of the injured is if they request a copy of the accident report form.

4. Flag Football

Flag football had the third highest injury rate (1:130) during this study. Although this total is not noticeably high when compared to other activities in this study, the number of injuries to freshmen in flag football is. Of the 407 injuries, 146 of them occurred in flag football accounting for 35.87% of all injuries. Of the 146 injuries in flag football, 46 of them occurred to freshmen students that accounted for 31.51% of all flag football injuries. The researcher believes that there are two reasonable answers to why freshmen encounter so many injuries in flag football at Oklahoma State University. One answer is that football is the first team sport offered in the fall of each school year, and flag football is the first intramural sport freshmen are exposed to. This is a new experience for both men and women. For men, flag football is a scaled-down version (physically) of football when compared to tackle football they may have played in high school. For women, flag football is usually their first true exposure to playing the game of football. These reasons may be why freshmen might have a difficult time adapting to all the regulations of intramural flag football. The researcher's recommendation to help freshmen adapt to intramural flag football is to hold a clinic on how flag football is different from tackle football and how intramural rules apply to the game.

5. Injury Data Collection

Injury data collection is an important aspect of an intramural program. During the years of this study, there was a total of 440 reported injuries. Of these 440 injuries, only 407 of them contained usable data for this study. The majority of the incomplete forms were missing data such as year in school, gender, or the location the injury occurred. Although 92.5% of the accident forms were usable for this study, a goal of 100% accurate forms is not

unreachable. Persons filling out the forms (in this study, intramural supervisors) need to be made aware of the importance of properly filled out forms. Not only should the information be accurate for record keeping purposes and statistical analysis, but it should also be kept accurate in the case of a litigation suit against the department. It is thought that the proposed accident form will help make it easier for the form to be filled out accurately 100% of the time.

6. Alternate Injury Rate Definition

The researcher suggests an alternate definition of an injury rate that involves comparing the number of injuries, the number of participants, and the total hours played in that sport. This would be a more accurate definition because of the addition of the number of hours played in that sport. This variable is crucial because the length of a contest depends on the sport. For example, someone participating in a golf match (approximately three hours) would be competing for a longer period of time than someone participating in softball (fifty minutes). It could be concluded that the person participating in the golf match is exposed to the chance of injury longer that the person participating in the softball game. Each contest has a specific length and, therefore, the exposure to injury is different from sport to sport.

SELECTED BIBLIOGRAPHY

Baletka, M. & Smith P. (1981). Rule changes can reduce injuries in touch/flag football. NIRSA Journal, 6 (1), 10-16.

Barone, J. (1995, March). Sneaky sports injuries. Men's Health, 52-54.

Bassett, F. H. (1994). Basketball. In B.S. Fu, F. H. & Stone, D. A. (Eds.), Sports Injuries: Mechanisms, Prevention, & Treatment (209-222), Baltimore: Williams & Wilkins.

Bloch, G. B. (1992, May). Sore points. American Health, 58-62.

Calvert, R. (1976). Athletic injuries and death in secondary schools and colleges.

Daniels, M. A. (1984). Liability for injuries in sports activities. Administration and Management, 1-9.

Deivert, R. G. (1989). Designing an emergency medical coverage program for recreational sports. NIRSA Journal, 45-47.

Dougherty, N., Auxter, D., Goldberger, A., & Heinzmann, G. (1994). Sport, Physical Activity, and the Law. Champaign, IL:Human Kinetics Publishers.

Editorial Board (1995, September 27). Intramural sports could be made safer. The Daily O' Collegian, 4.

Esckilsen, L. A. (1984). The value of documentation in intramural sports. NIRSA Proceedings, 202-212.

Flippin, R. (1992, May). Running scared. American Health, 61.

Fuerst, M. L. (1994, October). The 10 most common sports injuries. American Health, 66-70.

Garrick, J. G. & Webb, D. R. (1990). Sports Injuries: Diagnosis and Management. Philadelphia:W. B. Saunders Company.

Gaskins, D. A. (1994). Safety services/athletic training procedures in NIRSA region II recreational sports programs. NIRSA Journal, 19, 43-45.

Goldberg, B. (1989). Injury patterns in youth sports. The Physician and

Sportsmedicine, 17 (3), 174-186.

Green-Hall, K. & Pitman, H. (1993, Winter). Risk management in a recreational sports setting. NIRSA Journal, 17, 38-41.

Haines, D.J. (1994). A case study of injuries and contextual factors in university recreation (intramural sports) (Doctoral dissertation, The Ohio State University, 1994). Dissertation Abstracts International, 56/01, 1986.

Irrgang, J. J., Miller, M. D., & Johnson, D. L. (1994). Football. In B.S. Fu, F. H. & Stone, D. A. (Eds.), Sports Injuries: Mechanisms, Prevention, & Treatment (349-374), Baltimore: Williams & Wilkins.

James, J. (1995, October 9). Editorial board should check facts. The Daily O' Collegian, 4.

Kaiser, R. A. (1986). Liability & law in recreation, parks, & sports. Englewood Cliffs, NJ: Prentice-Hall.

Kaiser, D. A. & Stopka, C. B. (1990). Managing injuries in collegiate recreational sports. NIRSA Journal, 15, 14-17.

Kurtz, C. (1995, October 18). Intramural officials not responsible for injuries. The Daily O'Collegian, 4.

Lincoln, S. M. (1992, September). Sports injury risk management & the keys to safety-Coalition of Americans to Protect Sports (CAPS). JOPERD, 40-42, 68.

Lindenfeld, T. N., Noyes, F. R. & Marshall, M. T. (1988). Components of injury reporting systems. The American Journal of Sports Medicine, 16 (Suppl. 1) s69-s80.

Marcus, G., O'Donoghue, K., & Stopka, C. (1993). Athletic trainers for recreational sports. NIRSA Journal, 17, 46-47.

Mendryk, S. W. & Kramer, J. F. (1978). A critique of accident and injury reporting methodology. Canadian Journal of Applied Sport Sciences, 3, 1-3.

Mull, R., Bayless, K., & Ross, C. (1987). Recreational Sports Programming: Sports for All (2nd ed.). North Palm Beach, FL: The Athletic Institute.

Oklahoma State University Calendar/Handbook (1995-96). Oklahoma State University. Stillwater, Oklahoma.

Operhall, M. (1995, September 27). Intramural's medical help questioned. The Daily O' Collegian, 1.

Parsons, T. (1984). Risk management: Sport administrators' assessment of reality. NIRSA Journal, 9, 8, 10, 12-13.

Peterson, J. A., & Hronek, B. B. (1992). Risk Management for Park, Recreation, and Leisure Services (2nd ed.). Champaign, IL: Sagamore Publishing, Inc.

Ramos, C. I., Ellis, G. D., & Van Stratt, R. (1989). A causal model of sports injuries in college students. Collected Readings in Recreational Sports, 190-207.

Rankin, J. S. & Frakt, A. N. (1982). Current problems of liability in campus recreation, intramurals and club sports. NIRSA Proceedings, 24-35.

Ray, R. (1995, June). An electronic daily injury report system. Journal of Athletic Training, 180-181.

Salim, R. (1995, October 12). Sports medicine clinic offers additional services to all students. The Daily O'Collegian, 1.

Sandago, M. P. (1984). The use and computerization of injury reporting forms. NIRSA Review, 45-49.

Schafer, R. C. (1982). Chiropractic Management of Sports and Recreational Injuries. Baltimore: Williams & Wilkins.

van der Smissen, B. (1990). Legal Liability and Risk Management for Public and Private Entities. Cincinati: Anderson Publishing Company.

Vinger, P. F., & Hoerner, E. F. (1986). Sports Injuries: The Unthwarted Epidemic. (2nd ed.). Littleton, MA: PSG Publishing Company, Inc.

APPENDIXES

Table of Facility (Rows) By Level (Columns)

	1	2	3	4	5	6	Total	N
1	32	32	50	49	13	1	177	
	18.08	18.08	28.25	27.68	7.34	0.56	100.00	177
	35.16	36.36	52.63	47.57	48.15	33.33	43.49	177
2	0	0	1	0	0	0	1	
	0.00	0.00	100.00	0.00	0.00	0.00	100.00	1
	0.00	0.00	1.05	0.00	0.00	0.00	0.25	1
3	55	48	37	52	11	2	205	
	26.83	23.41	18.05	25.37	5.37	0.98	100.00	205
	60.44	54.55	38.95	50.49	40.74	66.67	50.37	205
4	1	0	2	0	0	0	3	
	33.33	0.00	66.67	0.00	0.00	0.00	100.00	3
	1.10	0.00	2.11	0.00	0.00	0.00	0.74	3
8	1	2	2	0	0	0	5	
	20.00	40.00	40.00	0.00	0.00	0.00	100.00	5
	1.10	2.27	2.11	0.00	0.00	0.00	1.23	5
9	0	1	1	0	0	0	2	
	0.00	50.00	50.00	0.00	0.00	0.00	100.00	2
	0.00	1.14	1.05	0.00	0.00	0.00	0.49	2
10	1	0	0	0	1	0	2	
	50.00	0.00	0.00	0.00	50.00	0.00	100.00	2
	1.10	0.00	0.00	0.00	3.70	0.00	0.49	2
11	1	4	1	2	2	0	10	
	10.00	40.00	10.00	20.00	20.00	0.00	100.00	10
	1.10	4.55	1.05	1.94	7.41	0.00	2.46	10
12	0	1	1	0	0	0	2	
	0.00	50.00	50.00	0.00	0.00	0.00	100.00	2
	0.00	1.14	1.05	0.00	0.00	0.00	0.49	2
Totals:	91	88	95	103	27	3	407	
	22.36	21.62	23.34	25.31	6.63	0.74	100.00	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Facility Index:

1=Basketball Court	2=Racquetball Court	3=Outdoor Field
4=Sand Volleyball Court	8=Colvin-Annex	9=Wrestling Mat
10=Hedge Field	11=Lewis Field	12=Tennis Courts

Level Index:

1=Freshman	2=Sophomore	3=Junior
4=Senior	5=Graduate	6= Faculty/Staff

First Line of Numbers is Frequency of Injuries.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Table of Gender (Rows) By Level In School (Columns)

	1	2	3	4	5	6	Total	N
1	62	63	72	79	22	3	301	
	20.60	20.93	23.92	26.25	7.31	1.00	100.00	301
	68.13	71.59	75.79	76.70	81.48	100.00	73.96	301
2	29	25	23	24	5	0	106	
	27.36	23.58	21.70	22.64	4.72	0.00	100.00	301
	31.87	28.41	24.21	23.30	18.52	0.00	26.04	301
Totals	91	88	95	103	27	3	407	
	22.36	21.62	23.34	25.31	6.63	.74	100.00	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Gender Index:

1=Male 2=Female

Level In School Index:

1=Freshman 2=Sophomore 3=Junior
4=Senior 5=Graduate 6=Faculty/Staff

First Line of Numbers Is Frequency of Injury.
Second Line of Numbers Is Row Percents.
Third Line of Numbers Is Column Percents.

Table of Location of Injury (Rows) By Type of Injury (Columns)

	1	2	3	5	6	7	Total	N
1	96	5	1	6	0	1	109	
	88.07	4.59	.92	5.50	6.00	.92	100.00	109
	36.92	6.94	3.85	19.35	0.00	25.00	26.78	109
2	109	0	6	1	0	1	117	
	93.16	0.00	5.13	.85	0.00	.85	100.00	117
	41.92	0.00	23.08	3.32	0.00	25.00	28.75	117
3	5	0	0	1	0	0	6	
	83.33	0.00	0.00	16.67	0.00	0.00	100.00	6
	1.92	0.00	0.00	3.32	0.00	0.00	1.47	6
4	14	0	3	0	0	2	19	
	73.68	0.00	15.79	0.00	0.00	10.53	100.00	19
	5.38	0.00	11.54	0.00	0.00	50.00	4.67	19
5	4	0	0	0	0	0	4	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	4
	1.54	0.00	0.00	0.00	0.00	0.00	.98	4
6	25	0	10	4	0	0	39	
	64.10	0.00	25.64	10.26	0.00	0.00	100.00	39
	9.62	0.00	38.46	12.90	0.00	0.00	9.58	39
7	5	0	0	0	0	0	5	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	5
	1.92	0.00	0.00	0.00	0.00	0.00	1.23	5
8	1	1	1	4	0	0	7	
	14.29	14.29	14.29	57.14	0.00	0.00	100.00	7
	.38	1.39	3.85	12.90	0.00	0.00	1.72	7
9	0	52	1	4	14	0	71	
	0.00	73.24	1.41	5.63	19.72	0.00	100.00	71
	0.00	72.22	3.85	12.90	100.00	0.00	17.44	71
11	0	0	0	2	0	0	2	
	0.00	0.00	0.00	100.00	0.00	0.00	100.00	
	0.00	0.00	0.00	6.45	0.00	0.00	.49	2
12	0	13	1	0	0	0	14	
	0.00	92.86	7.14	0.00	0.00	0.00	100.00	14
	0.00	18.06	3.85	0.00	0.00	0.00	3.44	14
14	1	0	2	3	0	0	6	
	16.67	0.00	33.33	50.00	0.00	0.00	100.00	6
	.38	0.00	7.69	9.68	0.00	0.00	1.47	6
15	0	1	1	6	0	0	8	
	0.00	12.50	12.50	75.00	0.00	0.00	100.00	8
	0.00	1.39	3.85	19.35	0.00	0.00	1.97	8
Totals	260	72	26	31	14	4	407	
	63.88	17.69	6.39	7.62	3.44	.98	100.00	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Location of Injury Index:

1=Knee 2=Ankle 3=Back/Neck 4=Shoulder
5=Thigh/Hip/Groin 6=Wrist/Hand 7=Foot/Toe 8=Elbow
9=Head/Face 10=Torso 11=Abdomen 12=Mouth
13=Arm 14=Leg 15=Shin

Type of Injury Index:

1=Sprain/Strain 2=Open Wound 3=Fracture/Bone Injury 4=Heat Reaction
5=Bruise 6=Head Injury 7=Dislocation

First Line of Numbers is Frequency of Injury.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Table of Sport (Rows) by Level of Participant (Columns)

	1	2	3	4	5	6	Total	N
1	0	0	1	0	0	0	1	
	0.00	0.00	100.00	0.00	0.00	0.00	100.00	1
	0.00	0.00	1.05	0.00	0.00	0.00	.25	1
2	46	27	27	38	6	2	146	
	31.51	18.49	18.49	26.03	4.11	1.37	100.00	146
	50.55	30.68	28.42	36.89	22.22	66.67	35.87	146
3	0	1	1	0	0	0	2	
	0.00	50.00	50.00	0.00	0.00	0.00	100.00	2
	0.00	1.14	1.05	0.00	0.00	0.00	.49	2
4	0	1	0	0	0	0	1	
	0.00	100.00	0.00	0.00	0.00	0.00	100.00	1
	0.00	1.14	0.00	0.00	0.00	0.00	.25	1
6	1	0	1	0	0	0	2	
	50.00	0.00	50.00	0.00	0.00	0.00	100.00	2
	1.10	0.00	1.05	0.00	0.00	0.00	.49	2
12	2	4	3	3	4	1	17	
	11.76	23.53	17.65	17.65	23.53	5.88	100.00	17
	2.20	4.55	3.16	2.91	14.81	33.33	4.18	17
13	1	2	3	1	1	0	8	
	12.50	25.00	37.50	12.50	12.50	0.00	100.00	8
	1.10	2.27	3.16	.97	3.70	0.00	1.97	8
15	0	0	1	0	0	0	1	
	0.00	0.00	100.00	0.00	0.00	0.00	100.00	1
	0.00	0.00	1.05	0.00	0.00	0.00	.25	1
17	5	2	3	3	1	0	14	
	35.71	14.29	21.43	21.43	7.14	0.00	100.00	14
	5.49	2.27	3.16	2.91	3.70	0.00	3.44	14
21	2	0	1	1	0	0	4	
	50.00	0.00	25.00	25.00	0.00	0.00	100.00	4
	2.20	0.00	1.05	.97	0.00	0.00	.98	4
22	18	21	38	35	7	0	119	
	15.13	17.65	31.93	29.41	5.88	0.00	100.00	119
	19.78	23.86	40.00	33.98	25.93	0.00	29.24	119
27	10	17	7	9	5	0	48	
	20.83	35.42	14.58	18.75	10.42	0.00	100.00	48
	10.99	19.32	7.37	8.74	18.52	0.00	11.79	48
29	0	1	0	0	0	0	1	
	0.00	100.00	0.00	0.00	0.00	0.00	100.00	1
	0.00	1.14	0.00	0.00	0.00	0.00	.25	1
32	1	7	3	7	3	0	21	
	4.76	33.33	14.29	33.33	14.29	0.00	100.00	21
	1.10	7.95	3.16	6.80	11.11	0.00	5.16	21
33	0	1	1	0	0	0	2	
	0.00	50.00	50.00	0.00	0.00	0.00	100.00	2
	0.00	1.14	1.05	0.00	0.00	0.00	.49	2
34	4	4	3	6	7	3	17	
	23.53	23.53	17.65	35.29	0.00	0.00	100.00	17
	4.40	4.55	3.16	5.83	0.00	0.00	4.18	17
37	1	0	2	0	0	0	3	
	33.33	0.00	66.67	0.00	0.00	0.00	100.00	3
	1.10	0.00	2.11	0.00	0.00	0.00	.74	3
Totals	91	88	95	103	27	3	407	
	22.36	21.62	23.34	25.31	6.63	.74	100.00	407
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	407

Sport Index:

1=Pre-Season Flag Football, 2=Flag Football, 3=Tennis Singles, 4=Ultimate Frisbee
6=Whiffleball, 12=Volleyball, 13=Superhoops, 15=Racquetball Singles
17=2-Ball Soccer, 21=Pre-Season Basketball, 22=Basketball, 27=Soccer
29=Ooofball, 32=Softball, 33=Wrestling, 34=Floor Hockey
37=Sand Volleyball

Level in School Index:

1=Freshman, 2=Sophomore, 3=Junior, 4=Senior
5=Graduate, 6=Faculty/Staff

First Line of Numbers is Frequency of Injury.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Table of Sport (Rows) by Type of Injury (Columns)

	1	2	3	5	6	7	Total	N
1	0	0	1	0	0	0	1	
	0.00	0.00	100.00	0.00	0.00	0.00	100.00	1
	0.00	0.00	3.85	0.00	0.00	0.00	.25	1
2	94	29	10	6	7	0	146	
	64.38	19.86	6.85	4.11	4.79	0.00	100.00	146
	36.15	40.28	38.46	19.35	50.00	0.00	35.87	146
3	2	0	0	0	0	0	2	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	2
	.77	0	0	0	0	0	.49	2
4	1	0	0	0	0	0	1	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	1
	.38	0.00	0.00	0.00	0.00	0.00	.25	1
6	1	1	0	0	0	0	2	
	50.00	50.00	0.00	0.00	0.00	0.00	100.00	2
	.38	1.39	0.00	0.00	0.00	0.00	.49	2
12	14	2	0	1	0	0	17	
	82.35	11.76	0.00	5.88	0.00	0.00	100.00	17
	5.38	2.78	0.00	3.23	0.00	0.00	4.18	17
13	4	1	1	0	2	0	8	
	50.00	12.50	12.50	0.00	25.00	0.00	100.00	8
	1.54	1.39	3.85	0.00	14.29	0.00	1.97	8
15	1	0	0	0	0	0	1	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	1
	.38	0.00	0.00	0.00	0.00	0.00	.25	1
17	9	1	1	3	0	0	14	
	64.29	7.14	7.14	21.43	0.00	0.00	100.00	14
	3.46	1.39	3.85	9.68	0.00	0.00	3.44	14
21	3	1	0	0	0	0	4	
	75.00	25.00	0.00	0.00	0.00	0.00	100.00	4
	1.15	1.39	0.00	0.00	0.00	0.00	.98	4
22	80	17	6	11	2	3	119	
	67.23	14.29	5.04	9.24	1.68	2.52	100.00	119
	30.77	23.61	23.08	35.48	14.29	75.00	29.24	119
27	30	6	4	6	2	0	48	
	62.50	12.50	8.33	12.50	4.17	0.00	100.00	48
	11.54	8.33	15.38	19.35	14.29	0.00	11.79	48
29	1	0	0	0	0	0	1	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	1
	.38	0.00	0.00	0.00	0.00	0.00	.25	1
32	12	6	2	1	0	0	21	
	57.14	28.57	9.52	4.76	0.00	0.00	100.00	21
	4.62	8.33	7.69	3.23	0.00	0.00	5.16	21
33	2	0	0	0	0	0	2	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	2
	.77	0.00	0.00	0.00	0.00	0.00	.49	2
34	3	8	1	3	1	1	17	
	17.65	47.06	5.88	17.65	5.88	5.88	100.00	17
	1.15	11.11	3.85	9.68	7.14	25.00	4.18	17
37	3	0	0	0	0	0	3	
	100.00	0.00	0.00	0.00	0.00	0.00	100.00	3
	1.15	0.00	0.00	0.00	0.00	0.00	0.00	3
Totals	260	72	26	31	14	4	407	
	63.88	17.69	6.39	7.62	3.44	.98	100.00	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Sport Index:

1=Pre-Season Flag Fotball 2=Flag Football 3=Tennis Singles 4=Ultimate Frisbee
6=Whiffleball 12=Volleyball 13=Superhoops 15=Racquetball Singles
17=2-Ball Soccer 21=Pre-Season Basketball 22=Basketball 27=Soccer
29=Ooofball 32=Softball 33=Wrestling 34=Floor Hockey
37=Sand Volleyball

Type Of Injury Index:

1=Sprain/Strain 2=Open Wound 3=Fracture/Bone Injury 5=Bruise
6=Head Injury 7=Dislocation

First Line of Numbers Is Frequency of Injury.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Table of Sport (Rows) by Year of Injury (Columns)

	1	2	3	Total	N
1	1	0	0	1	
	100.00	0.00	0.00	100.00	1
	74	0.00	0.00	.25	1
2	39	53	54	146	
	26.71	36.30	36.99	100.00	146
	28.89	44.54	35.29	35.87	146
3	1	1	0	2	
	50.00	50.00	0.00	100.00	2
	74	.84	0.00	.49	2
4	1	0	0	1	
	100.00	0.00	0.00	100.00	1
	.74	0.00	0.00	.49	1
6	2	0	0	2	
	100.00	0.00	0.00	100.00	2
	1.48	0.00	0.00	.49	2
12	7	2	8	17	
	41.18	11.76	47.06	100.00	17
	5.19	1.68	5.23	4.18	17
13	5	1	2	8	
	62.50	12.50	25.00	100.00	8
	3.70	.84	1.31	1.97	8
15	1	0	0	1	
	100.00	0.00	0.00	100.00	1
	.74	0.00	0.00	.25	1
17	4	5	5	14	
	28.57	35.71	35.71	100.00	14
	2.96	4.20	3.27	3.44	14
21	2	0	2	4	
	50.00	0.00	50.00	100.00	4
	1.48	0.00	1.31	.98	4
22	51	31	37	119	
	42.86	26.05	31.09	100.00	119
	37.78	26.05	24.18	29.24	119
27	11	15	22	48	
	22.92	31.25	45.83	100.00	48
	8.15	12.61	14.38	11.79	48
29	0	0	1	1	
	0.00	0.00	100.00	100.00	1
	0.00	0.00	.65	.25	1
32	9	7	5	21	
	42.86	33.33	23.81	100.00	21
	6.67	5.88	3.27	5.16	21
33	0	0	2	2	
	0.00	0.00	100.00	100.00	2
	0.00	0.00	1.31	.49	2
34	1	1	15	17	
	5.88	5.88	88.24	100.00	17
	.74	.84	9.80	4.18	17
37	0	3	0	3	
	0.00	100.00	0.00	100.00	3
	0.00	2.52	0.00	74	3
Totals	135	119	153	407	
	33.17	29.24	37.59	100.00	
	100.00	100.00	100.00	100.00	

Sport Index:
1=Pre-season Flag Football, 2=Flag Football, 3=Tennis Singles, 4=Ultimate Frisbee
6=Whiffleball Singles, 12=Volleyball, 13=Superhoops, 15=Racquetball
27=Soccer, 17=2-Ball Soccer, 21=Pre-Season Basketball, 22=Basketball
34=Floor Hockey, 29=Ooofball, 32=Softball, 33=Wrestling
37=Sand Volleyball

Year of Injury Index:
1=Freshman, 2=Sophomore, 3=Junior, 4=Senior
5=Graduate, 6=Faculty/Staff

First Line of Numbers is Frequency of Injury.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Table of Type of Injury (Rows) by Year of Injury (Columns)

	1	2	3	Total	N
1	87	76	97	260	
	33.46	29.23	37.31	100.00	260
	64.44	63.87	63.40	63.88	260
2	23	18	31	72	
	31.94	25.00	43.06	100.00	72
	17.04	15.13	20.26	17.69	72
3	9	11	6	26	
	34.62	42.31	23.08	100.00	26
	6.67	9.24	3.92	6.39	26
5	7	10	14	31	
	22.58	32.26	45.16	100.00	31
	5.19	8.40	9.15	7.62	31
6	7	3	4	14	
	50.00	21.43	28.57	100.00	14
	5.19	2.52	2.61	3.44	14
7	2	1	1	4	
	50.00	25.00	25.00	100.00	4
	1.48	0.84	0.65	0.98	4
Totals	135	119	153	407	
	33.17	29.24	37.59	100.00	
	100.00	100.00	100.00	100.00	

Sport Index:

1=Pre-Season Flag Football
2=Flag Football
3=Tennis Singles
4=Ultimate Frisbee
6=Whifflebal
12=Volleyball
13=Superhoops
15=Racquetball Singles
17=2-Ball Soccer
21=Pre-Season Basketball
22=Basketball
27=Soccer
29=Oofball
32=Softball
33=Wrestling
34=Floor Hockey
37=Sand Volleyball

Year of Injury:

1=1994-95 (8/94-7/95)
2=1993-94 (8/93-7/94)
3=1992-93 (8/92-7/93)

First Line of Numbers is Frequency of Injury.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Table of Location of Injury (Rows) by Sport (Columns)

	1	2	3	4	6	12	13	15	17
1	0	47	1	0	1	4	3	1	3
	0.00	43.12	0.92	0.00	0.92	3.67	2.75	0.92	2.75
	0.00	32.19	50.00	0.00	50.00	23.53	37.50	100.00	21.43
2	0	25	1	0	0	8	3	0	4
	0.00	21.37	0.85	0.00	0.00	6.84	2.56	0.00	3.42
	0.00	17.12	50.00	0.00	0.00	47.06	37.50	0.00	28.57
3	0	3	0	0	0	0	0	0	1
	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67
	0.00	2.05	0.00	0.00	0.00	0.00	0.00	0.00	7.14
4	1	8	0	0	0	0	0	0	0
	5.26	42.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	100.00	5.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0	4	0	0	0	0	0	0	0
	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0	17	0	1	0	3	0	0	1
	0.00	43.59	0.00	2.56	0.00	7.69	0.00	0.00	2.56
	0.00	11.64	0.00	100.00	0.00	17.65	0.00	0.00	7.14
7	0	2	0	0	0	0	0	0	1
	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00
	0.00	1.37	0.00	0.00	0.00	0.00	0.00	0.00	7.14
8	0	0	0	0	0	0	0	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0	34	0	0	1	2	2	0	1
	0.00	47.89	0.00	0.00	1.41	2.82	2.82	0.00	1.41
	0.00	23.29	0.00	0.00	50.00	11.76	25.00	0.00	7.14
11	0	0	0	0	0	0	0	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0	2	0	0	0	0	0	0	0
	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0	3	0	0	0	0	0	0	0
	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0	1	0	0	0	0	0	0	3
	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	37.50
	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	21.43
Totals	1	146	2	1	2	17	8	1	14
	0.25	35.87	0.49	0.25	0.49	4.18	1.97	0.25	3.44
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Location of Injury Index:
1=Knee 2=Ankle 3=Back/Neck4=Shoulder 5=Thigh/Hip/Groin 6=Wrist/Hand 7=Foot/Toe8=Elbow 9=Head/Face
11=Abdomen 12=Mouth 14=Leg 15=Shin

Sport Index:
1=Pre-Season Flag Football2=Flag Football 3=Tennis Singles 4=Ultimate Frisbee 6=Whiffleball 12=Volleyball 13=Superhoops
15=Racquetball Singles 17=2-Ball Soccer 21=Pre-Season Basketball 22=Basketball 27=Soccer 29=Ooofball 32=Softball
33=Wrestling 34=Floor Hockey 37=Sand Volleyball

First Line of Numbers is Frequency of Injury.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Table Continued On Next Page

Table of Location of Injury (Rows) By Sport (Columns) Continued

	21	22	27	29	32	33	34	37	Total	N
1	0	29	11	0	5	1	3	0	109	
	0.00	26.61	10.09	0.00	4.59	0.92	2.75	0.00	100.00	109
	0.00	24.37	22.92	0.00	23.81	50.00	17.65	0.00	26.78	109
2	2	50	16	1	5	0	1	1	117	
	1.71	42.74	13.68	0.85	4.27	0.00	0.85	0.85	100.00	117
	50.00	42.02	33.33	100.00	23.81	0.00	5.88	33.33	28.75	117
3	0	1	1	0	0	0	0	0	6	
	0.00	16.67	16.67	0.00	0.00	0.00	0.00	0.00	100.00	6
	0.00	0.84	2.08	0.00	0.00	0.00	0.00	0.00	1.47	6
4	0	4	3	0	1	0	0	2	19	
	0.00	21.05	15.79	0.00	5.26	0.00	0.00	10.53	100.00	19
	0.00	3.36	6.25	0.00	4.76	0.00	0.00	66.67	4.67	19
5	0	0	0	0	0	0	0	0	4	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	4
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	4
6	1	9	1	0	3	1	2	0	39	
	2.56	23.08	2.56	0.00	7.69	2.56	5.13	0.00	100.00	39
	25.00	7.56	2.08	0.00	14.29	50.00	11.76	0.00	9.58	39
7	0	1	0	0	1	0	0	0	5	
	0.00	20.00	0.00	0.00	20.00	0.00	0.00	0.00	100.00	5
	0.00	0.84	0.00	0.00	4.76	0.00	0.00	0.00	1.23	5
8	0	7	0	0	0	0	0	0	7	
	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	7
	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	1.72	7
9	1	14	7	0	1	0	8	0	71	
	1.41	19.72	9.86	0.00	1.41	0.00	11.27	0.00	100.00	71
	25.00	11.76	14.58	0.00	4.76	0.00	47.06	0.00	17.44	71
11	0	0	1	0	0	0	1	0	2	
	0.00	0.00	50.00	0.00	0.00	0.00	50.00	0.00	100.00	2
	0.00	0.00	2.08	0.00	0.00	0.00	5.88	0.00	0.49	2
12	0	4	2	0	5	0	1	0	14	
	0.00	28.57	14.29	0.00	35.71	0.00	7.14	0.00	100.00	14
	0.00	3.36	4.17	0.00	23.81	0.00	5.88	0.00	3.44	14
14	0	0	2	0	0	0	1	0	6	
	0.00	0.00	33.33	0.00	0.00	0.00	16.67	0.00	100.00	6
	0.00	0.00	4.17	0.00	0.00	0.00	5.88	0.00	1.47	6
15	0	0	4	0	0	0	0	0	8	
	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	100.00	8
	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	1.97	8
Totals	4	119	48	1	21	2	17	3	407	
	0.98	29.24	11.79	0.25	5.16	0.49	4.18	0.74	100.00	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Location of Injury Index:
1=Knee 2=Ankle 3=Back/Neck 4=Shoulder 5=Thigh/Hip/Groin 6=Wrist/Hand 7=Foot/Toe 8=Elbow 9=Head/Face 11=Abdomen 12=Mouth 14=Leg 15=Shin

Sport Index:
1=Pre-Season Flag Football2=Flag Football 3=Tennis Singles 4=Ultimate Frisbee 6=Whiffleball 12=Volleyball 13=Superhoops 15=Racquetball Singles 17=2-Ball Soccer 21=Pre-Season Basketball 22=Basketball 27=Soccer 29=Ooofball 32=Softball 33=Wrestling 34=Floor Hockey 37=Sand Volleyball

First Line of Numbers is Frequency of Injury.
Second Line of Numbers is Row Percents.
Third Line of Numbers is Column Percents.

Oklahoma State University Campus Recreation Accident Report Form

Personal Information

Date:_____/_____/_____ Time:_____Staff Name (position):_____

Name Of Injured:_____ ID#:_____

Address:_____ Phone#:_____

Gender:____ M-1 F-2 Classification:____ Fr-1 So-2 Jr-3 Sr-4 Grad-5 Faculty/Staff-6 Other-7 Age:_____

Guest Of Whom:_____ Host's Phone #:_____

Witness (name, address, & phone):1)_____

2)_____

Facility

Please indicate where in the facility the accident occurred!

____Colvin Center-1 (4-Gym-2, 2-Gym-3, Weight Room-4, Fitness Room-5, Locker Room-6, Racquetball Ct.-7, Aerobics-8, Body Mechanics-9, Classroom-10, Other-11_____) ____Annex-12 ____Camp Redlands-13

____Colvin Fields-14 ____Tennis Courts-15 ____Sand VB Courts-16 ____Lewis Field-17 ____Willis Fields-18

____Indoor Pool-19 ____Outdoor Pool-20 ____Other (be specific)-21:_____

Please describe the conditions of facility (be specific): _____

Department

Please Specify Activity!

____Intramurals-1_____ ____PEP Class-2_____

____Open Rec-3_____ ____HPEL Class-4_____

____Special Event-5_____ ____NYSP-6_____

____Summer Camp-7_____ ____Other-8_____

Injury

Suspected or known area of injury-indicate right(r) or left(l) if applicable.

____Ankle-1 ____Knee-2 ____Back/Neck-3 ____Shoulder-4 ____Thigh/Hip/Groin-5

____Wrist/Hand-6 ____Foot/Toe-7 ____Elbow-8 ____Head/Face-9 ____Mouth-10

____Torso-11 ____Abdomen-12 ____Arm-13 ____Leg-14 ____Shin/Calf-15

____Other-16:_____

Brief description of how injury occurred (use back if necessary):_____

Action Taken

First Aid Applied?(Y or N)_____ If yes, by whom?(position)_____ Type of Treatment:_____

Treatment refused?(Y or N)_____ Ambulance Called?(Y or N)____ If No, how were they moved?_____

Staff Signature:_____ **Injured's Signature:**_____

Follow-Up

Please initialize Each Call!

Date and Time:_____ Reached?(Y or N)_____ Date and Time:_____ Reached?(Y or N)_____

Date and Time:_____ Reached?(Y or N)_____ Date and Time:_____ Reached?(Y or N)_____

Name of Person Reached:_____ Requested copy of this form?(Y or N)____

If Yes, results of injury:_____

VITA

Jason Krone

Candidate for the Degree of

Master of Science

Thesis: ANALYSIS OF INTRAMURAL SPORTS INJURY RATES AT OKLAHOMA STATE UNIVERSITY

Major Field: Health, Physical Education, and Leisure

Biographical:

Personal Data: Born in Manhattan, Kansas, on December 10, 1971, the son of James and Sharon Krone.

Education: Graduated from Atchison High School, Atchison, Kansas in May 1990; received Bachelor Of Science degree in Recreation from Northwest Missouri State University, Maryville Missouri in August 1994. Completed the requirements for the Master of Science degree with a major in Health, Physical Education, & Leisure at Oklahoma State University in July 1996.

Experience: Raised in Atchison, Kansas; employed as a coach, supervisor, and maintenance worker during summers; employed by Northwest Missouri State and the University of Virginia as an undergraduate facility supervisor; employed by Oklahoma State University, Intramurals Department as a graduate assistant Fall 1994 to present.

Professional Memberships: National Intramural Recreational Sports Association (NIRSA), Oklahoma Student State Representative for NIRSA.